



MARCH 1956

chemical processing

For Men who Manage

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EXECUTIVE MAGAZINES FOR INDUSTRY

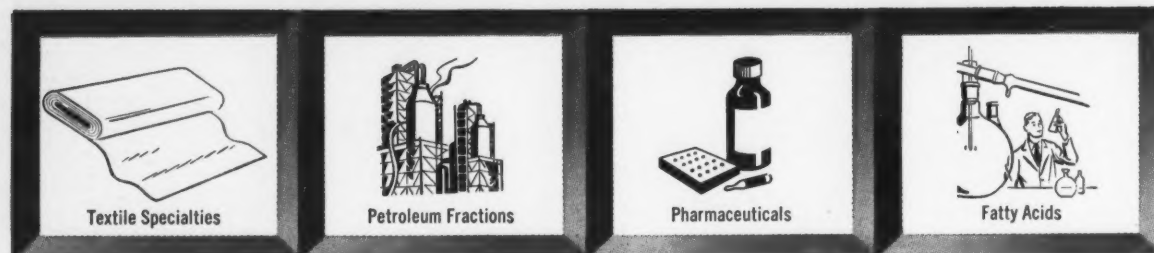
CONCRETE ARCHES SUPPORT SALT

... 20,000 tons of it ... in International Salt's
cathedral-like Chicago warehouse

Your "tour" of the facilities starts on page 10

CP Staff Photo

FOR SULFONATIONS SULFATIONS



Textile Specialties

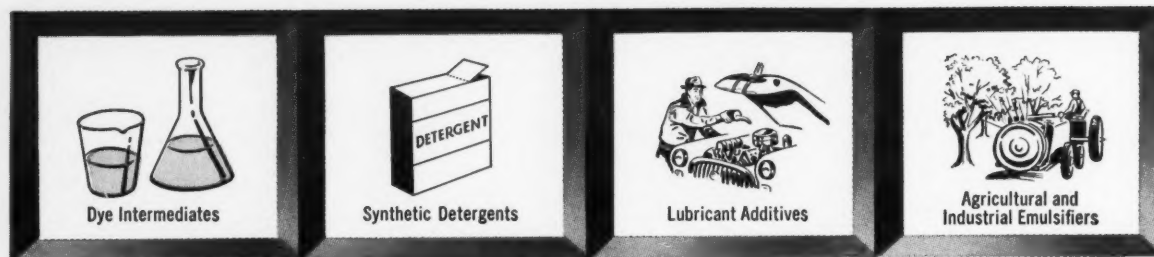
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GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

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Basic Chemicals
for American Industry

When inquiring check CP 3985 opposite last page

**THAT'S
INTERESTING**



"Could only play nine holes this morning — radio went (ugh!) dead"

"Fore!"

A complete broadcasting set has been designed to fit inside of a plastic "golf ball" about the size of a regulation ball. Unit is so sturdy and shock-resistant that ball may be bounced on the floor. Despite set's size, the transmitted signal is sufficiently strong to be picked up by a portable, pocket-size receiver.

By rotating the receiver as a direction finder the "lost" ball may be easily located — even in the rough.

While still a gadget, the small set gives the weekend golfer something to dream about. (*Inside Motorola*)

Modern Rosetta Stone

What the Rosetta Stone — found buried in Egypt in eighteen-something — was to Egyptology, a corner stone buried by Procter & Gamble at their new Cincinnati office building may be to the study of our present-day civilization.

This modern Rosetta Stone, a pottery clay tablet, is inscribed with the first book of Genesis in over 40 modern and classical languages.

Some of the more unfamiliar tongues include Urdu, Swahili, Annamese, and Tagalog . . . all of which may help explain our civilization to those ages in the future.

There's some air too

Enough for 2.2 million tons of sulfuric acid — that's the amount of sulfur dioxide gas poured into the New York City atmosphere each year. New York Department of Air Pollution Control has conducted a two-year survey of the city's air pollution and put the finger on coal and fuel oil as the chief villains in the sulfur dioxide picture, although there are numerous other culprits.

(Please turn to page 223)

chemical processing

(CHEMICAL PROCESSING PREVIEW)

for men who manage

Vol. 19

March, 1956

No. 3

Serving more than 45,000 circulation in these industries:

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Forget CORROSION
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The Chem Show was just a start

A good many chemical people who visited the show in Philadelphia last December have forgotten about it by now. This isn't to say that they may not be working on some ideas that came to light at the show or as a result of it . . . but by and large, the show and its immediate consequences are past.

The point to mentioning the show at all is the evident fact that it is still very much with the editors of CHEMICAL PROCESSING. At the show our editors made literally hundreds of notes on ideas that they felt would interest you. Some of these have borne fruit . . . some of the stories in this issue started there.

But for the most part, this is the period of gestation . . . the work of checking, getting more "dope," settling details, and arranging to make plant calls that will turn our notes into stories you will profit by reading.

Actually, this period (right after the turn of the year as this is being written) is one of the busiest for our chemical editors. We thought you might be interested in knowing that somebody is still involved in the idea-gathering process of a chemical show. Perhaps it will be a pleasant thought to you next time you retreat, footsore, at the end of a day at the show itself.

Bruce Fader

Associate Editor

• For more information on articles and advertisements in this issue, check the Reader Service slip opp. last page

• The product directory, pages 213 to 216, is your guide to all articles and advertisements

• To subscribe to this magazine, see reader-qualification form opp. last page

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THIS MONTH'S COVER

Our cover for this month shows the interior of International Salt's new Chicago warehouse. Shovel-tractor performs only operation not completely automatic. Your "plant tour" begins on page 10.



Mar 7-8. Commercial Chemical Development Assn., Statler Hotel, New York.

Mar 8-9. The American Institute of Electrical Engineers, Conference on Electrical Engineering as applied to the Paper and Pulp Industry, University of Florida, Gainesville.

Mar 9. American Institute of Chemical Engineers, Sabine Area Section and American Chemical Society, Texas-Louisiana Gulf Section, Third Annual Technical Meeting, Lamar State College of Technology, Beaumont, Texas.

Mar 12-16. Twelfth Annual Conference and Corrosion Show, National Association of Corrosion Engineers, Statler Hotel, New York City.

Apr 9-12. 25th National Packaging Exposition, The American Management Association, Convention Hall, Atlantic City.

Apr 10-11. Symposium for Management on Applications of Analog Computers, Midwest Research Institute, University of Kansas City, Kansas City, Missouri.

Apr 10-12. Twelfth Annual Meeting and 1956 Metal Powder Show, Metal Powder Association, Hotel Cleveland, Cleveland.

Apr 18-20. National Industrial Research Conference, Armour Research Foundation of Illinois Institute of Technology, Illinois Tech Campus, Chicago.

Apr 19-20. Environmental Equipment Institute, Science Section, Second Annual Meeting, Sheraton Hotel, Chicago.

Apr 23-28. Chemical Progress Week, sponsored by Manufacturing Chemists' Association.

Apr 25. Association of Consulting Chemists and Chemical Engineers, Banquet and Symposium, Belmont Plaza Hotel, New York City.

Apr 26-27. American Institute of Electrical Engineers, Instruments & Measurement Committee, Conference on Recording and Controlling Instruments, Bradford Hotel, Boston.

Apr 27. Society of Chemical Industry, Chemical Industry Medal Presentation, Waldorf-Astoria Hotel, New York City.

Apr 29-30. The Electrochemical Society, Inc., Mark Hopkins Hotel, San Francisco.

May 6-9. The American Institute of Chemical Engineers, Roosevelt Hotel, New Orleans, Louisiana.

May 9-11. American Institute of Chemists, Annual Meeting, Statler Hotel, Boston.

May 9-11. Welding Show, American Welding Society, Memorial Auditorium, Buffalo, New York.

May 14-15. Chemical Market Research Association, Biltmore Hotel, New York City.

May 14-17. Design Engineering Show, Convention Hall, Philadelphia.

May 27-June 2. American Society for Testing Materials, Fourth Conference on Mass Spectrometry, Netherlands Plaza Hotel, Cincinnati.

now FOR DC OR RESISTANCE INPUT

MODEL 200-A uses an input of 10,000 ohm resistance potentiometers as an input transducer providing 10 to 1 scale expansion and origin positioning. Available standard digital input accessories are essentially inputs of this type. Any resistance potentiometer will provide an analog input for this configuration.

MODEL 200-B, used for D.C. signal input, has full scale sensitivities of 5 millivolts and an input impedance of 1,000 megohms. Utilizing standard reference cells, this model provides drift-free operation. Available external reference voltages may be substituted. A plug connection is provided to facilitate the quick interchangeability of input sections.

now FOR SIMPLIFIED OPERATION

Precision Vernier Dials provide an accurate method for obtaining fine adjustment during operation. Optional point plot or continuous line plotting is a feature of both models. Selection is by front panel manual control. A new, simplified pen of one-piece design—used for point or continuous plotting—eliminates bottles and tubes, permits rapid changing of ink colors. Independent action of the X and Y axis is achieved with Librascope's unique "Floating Gear Train." No cables, tapes or lead screws to cause lost motion, cable stretching or drifting out of alignment. The 120° concave cylindrical plotting surface provides full visibility... is completely illuminated.

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These fast, dependable general purpose plotters feature 0.1% accuracy, are suited for wide applications where rapid graphic presentation of data is required, such as: laboratory testing, computers, data handling systems, wind tunnel, missile tracking and quality control testing of transistors and other electronic components. Input selection includes Punched Card and Tape Converters, Decimal Keyboards and Binary Converters. Model 200-A can plot from Flexowriter tape in any code or directly from the Tape Punch cables of many digital computers. Subchassis can be supplied to handle time-shared X versus Y plots, or other special circuitry. Write today for details.

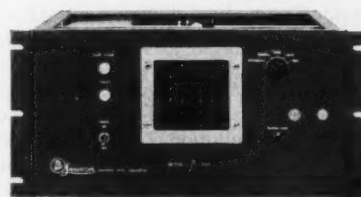
LIBRASCOPE X-Y PLOTTER

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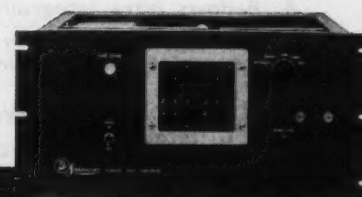


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Operates from a punched tape reader—Specially designed for Librascope X-Y Plotters—This unit is adaptable to other plotters.



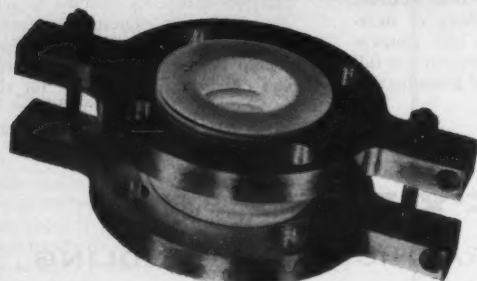
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NEW

Steel Flanged
TEFLON
Bellows
by Doré



This new style E-8F Flanged TEFLON Bellows has a multiplicity of advantages over conventional types. It overcomes incorrect flanges, the principal cause of bellows failure. The design and construction of this new style E-8F bellows, developed by Doré, is furnished at no additional cost over present prices.

1. The sealing surfaces are the flat-test, smoothest, most perfect ever molded on TEFLON Bellows.
2. The split standard steel flanges are doweled and bolted together, assuring perfect alignment and positive prevention of cocking at the split.
3. Limit bolts beyond O.D. of flange can be adjusted to restrain movement within longitudinal limits of bellows.
4. Bellows have integrally molded envelope type gaskets, eliminating use of rubber against steel.

The style E-8F Bellows are available in diameters 1" through 24".

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AIR POLLUTION *a word to the wise*

DR. W. L. FAITH
Vice President and Chief Engineer
Air Pollution Foundation

THE sage who first said, "Hindsight is better than foresight" might well have added "but it's a great deal more expensive." Nowhere is this truer than in the field of air pollution. In Los Angeles, for example, the air pollution problem became so acute in the early 1940's that an unusual law authorizing the establishment of air pollution control districts in every county in California was passed by the State Legislature in 1947. Los Angeles County immediately took advantage of the authorization and set up the Los Angeles County Air Pollution Control District, with authority over 46 municipalities, including the City of Los Angeles, in air pollution matters.

The public demanded action and they obtained it. Little time was available for a thorough evaluation of the problem by political authorities, and industry didn't know the answers. In many cases industry didn't know what its airborne effluents were, and had few data on the contribution of these effluents to the nuisances to which people

objected. As a consequence, industry was saddled with a bill for 33 million dollars in control equipment.

New Research Tools

In spite of control measures, Los Angeles still has a critical smog problem. The Air Pollution Foundation, created in early 1954, predicted that smog would get worse before becoming better as a result of increased numbers of motor vehicles, industrial plants, and incinerators. It stated that before the brown menace could be conquered, smog workers would have to find new tools which would reveal what is happening in the air during smoggy periods.

Nine instruments which the Foundation has conceived, adapted, or sponsored for use in air chemistry are working on this riddle.

Four instruments are combined in around-the-clock operation to measure and record concentrations of four pollutants: oxidant, oxidant precursor, nitric oxide and nitrogen dioxide. Amounts are recorded on a single roll of graph paper allowing scientists to make side-by-side comparisons otherwise extremely difficult and time-consuming.

The ozone radiometer is a photoelectric device

CHEMICAL PROCESSING

Dr. Faith received his BS from the University of Maryland, 1928; MS from University of Illinois, 1929; and PhD in Chemical Engineering from Illinois in 1932. He joined Kansas State College as Assistant Professor and later served as Head of Department of Chemical Engineering. He was consultant and later Deputy Director of Office of Production Research and Development, War Production Board, 1942-45. From 1945-54 he was with Corn Products Refining Company as Director of Development Engineering and later Director of Engineering, Chemical Div. He joined the Air Pollution Foundation in March, 1954. Dr. Faith is also a past member of CHEMICAL PROCESSING'S Editorial Advisory Board.

which measures this poisonous smelly gas suspected of being a major cause of rubber cracking, paint deterioration, plant damage, and other smog manifestations.

Carbon monoxide recorders, standard instruments with their sensitivity stepped up by addition of pressure cells, make it possible to tell from any unusual concentration of carbon monoxide in the air whether a high proportion of the pollution over a given area is from motor vehicles.

A hydrocarbon recorder automatically and continuously measures and records the concentration of hydrocarbons which escape during manufacture and use of gasoline and other petroleum products.

A photo-electronic aerosol particle counter segregates tiny visibility-clouding particles in the atmosphere into 20 separate size groups, all of microscopic minuteness.

To gain information on variations in the height of the inversion layer, specially constructed aerometeorographs, weighing only one pound, are attached to small captive balloons to probe the atmosphere at various levels and to bring back continuous readings on temperature, air pressure, and relative humidity.

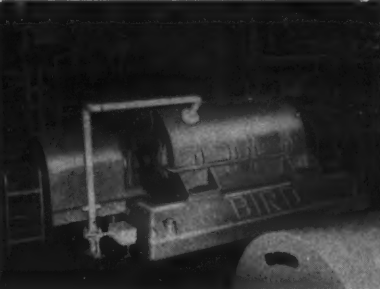
Taking the Initiative

Think of what the situation would be today if industry had taken the initiative, evaluated its emissions both qualitatively and quantitatively, and cooperatively measured the air stream of the community meteorologically, chemically, and physically. The wheat would have been separated from the chaff, public confidence might have been maintained, adequate controls might already be developed, and the total cost could well have been no greater than it is now. Conflict would have been lessened and perhaps even the solution would be in hand. This is hindsight, so more money and more time are inevitable.

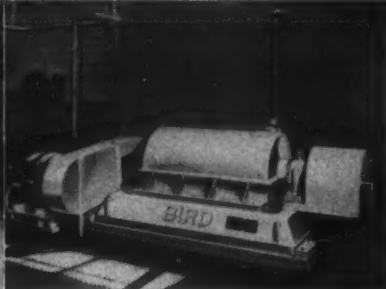
A large segment of the chemical and process in-

(Please turn to page 212)


SIX INTERESTING FILTERING PROBLEMS




Filtering fine salt crystals from 80% glycerine solution at a temperature of 300°F. High temperature offers no problem to the successful use of the Bird Filter.




Filtering a feed product. The Bird is the ideal filter — completely enclosed, involves no delay in process, easily sterilized.



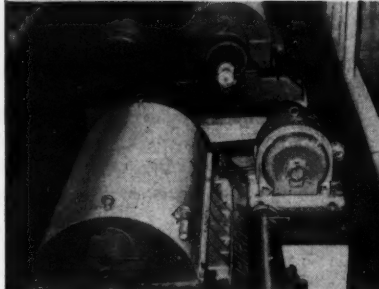
Filtering mineral crystals, plus 28 mesh, plus 4 abrasive hardness. The mother liquor is a hot saturated solution. A tough problem for most filters but "duck soup" for the Bird Filter.



Recovering calcium carbonate from water softening sludge. The feed contains valuable calcium carbonate but undesirable magnesium and iron compounds. The Bird is operated to recover the values but discard the rejects with the filtrate.



Separation of vegetable meal from a solvent-oil miscella. Solvent recovery is obviously important. The filter must be vapor-tight to allow recovery and provide safety. Birds are 100% tight when specified.



Separation of potato starch from its protein water. This job must be done quickly otherwise the starch will discolor. Material is retained in the Bird only a few seconds, no time for oxidation. High quality starch is the result.

ONE BIRD SOLVES THEM ALL

WITH AN ASSIST FROM

THE BIRD RESEARCH
AND DEVELOPMENT CENTER

These are just a few of the hundreds of different jobs being handled efficiently and economically by Bird Continuous Centrifugal Filters. On some, solids are a fraction of a micron in size; on others they are $\frac{1}{2}$ " or more. Feed slurries range from 3% solids or less to thickener underflows. Cost of operation and maintenance generally totals a few cents or less per ton.

Why not find out if the Bird Continuous Centrifugal Filter is the answer to *your* filtering problem? You'll get the *right* answer quickly,

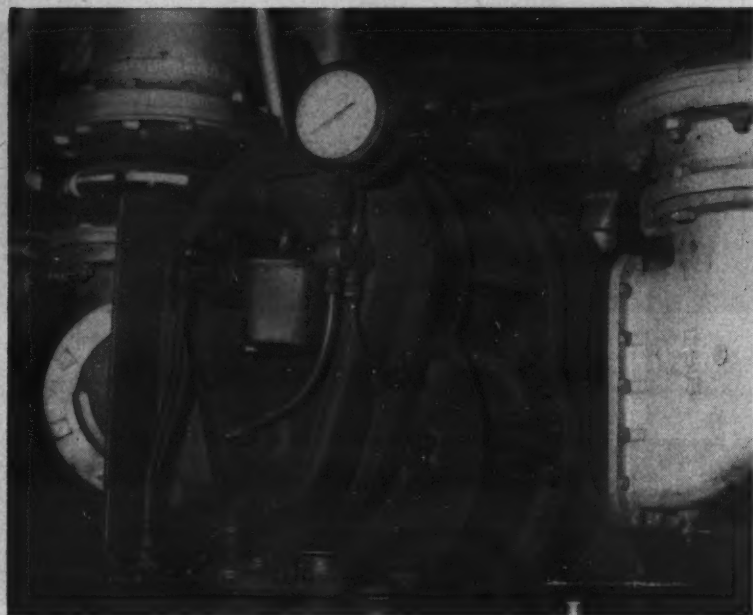
based on accurate pilot-scale test data prepared by the Bird Research and Development Center.

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**BIRD CONTINUOUS
CENTRIFUGAL FILTER**

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Operates 15 months at 165% overload — not a sign of wear

A large eastern chemical company, requiring a continuous high volume of air, installed the 980 pound Standardaire Blower shown above to replace a 4800 pound blower of competitive manufacture.

This Standardaire model, a low pressure unit rated to operate at 1750 rpm and 4.5 psi, was forced to operate at 2200 rpm and 12 psi day and night, out of doors . . . for 15 months. During that time, it moved approximately 1½ billion cubic feet of air.

Disassembled to determine the effects of this grueling run, engineers detected no discernible sign of wear. The main and gate rotors were like new. The interior was completely dry and free of oil. Axial clearance of the main rotor shaft thrust-radial bearing had increased less than 0.0005 in. Other bearings were in perfect order.

Reports such as this are not unusual. Standardaire Blowers installed throughout this country and others are performing under exceptional overload conditions for extended periods without maintenance other than lubrication. These units provide greater capacity per pound of blower with less power consumption than any other make. Write for complete information.

READ STANDARD
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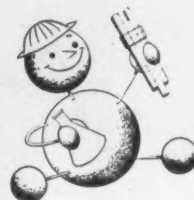
BLOWER-STOKER DIVISION
370 LEXINGTON AVENUE, NEW YORK 17, NEW YORK

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*what you can expect in
next month's issue . . .*

Chemical Materials Annual Survey



Besides the regular articles describing latest chemical developments, next month's "Materials" section will bring CHEMICAL PROCESSING's Annual Chemical Materials Survey. Outstanding feature of this descriptive listing of half a hundred chemical products introduced during 1955 is the "use index", to help you find just what you need for a specific application, quickly and easily. Manufacturers' names and addresses are listed, too.

Other highlights in next month's issue will include a guest editorial by Robert Bateman, Sales Manager of Carbide and Carbon Chemicals Company and President of the Commercial Chemical Development Association. His subject: Communications in Commercial Chemical Development.

The section also features two nomographs by Associate Editor Bruce Fader. One gives vapor pressures (between 0.5 and 5000 mm Hg) of thirty-six common solvents. Another simplifies conversions between the various units for expressing colors.

Don't miss this section in April.

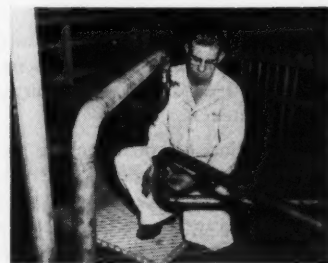
Boilers fueled by aqueous liquor containing only 57% solids

Each week, Consolidated Water Power and Paper Company must burn 1200 tons of concentrated waste sulfite liquor containing only 57% solids. By equipping existing boiler facilities with pre-burners, they have been able to get the dilute liquor to support combustion without supplementary fuel.

Assistant Editor Bill Clarke made a trip to Consolidated at Appleton, Wisconsin and brought back the story. You'll find it in next month's "New Solutions" section.

Tank-farm control — it's done with wires

Esso's sprawling Bayway Refinery in New Jersey needed additional tank capacity to meet seasonal fuel oil demands. Since fuel oil is often handled by barges, new tank capacity had to be accessible to water. But available waterside space was all taken up. Esso solved the problem by putting a new tank farm on available ground — miles from the dock — and using a two-wire supervisory system to control valves and pumps from the dock. Associate Editor Bruce Fader visited the installation and brought back details for an "Idea" section feature in April.



"Switchboard" eases process line hook-up

When Lilly designed its new Tippecanoe Lab at Lafayette, Ind., engineers looked for some way of keeping process pipelines as simple as possible. Lines had to be capable of handling many different materials going to many different places. Speed and ease of changeover were of prime import . . . sanitation was imperative.

"Switchboard" layout the engineers came up with fit the bill perfectly. All pipelines converge on a central location. Changeovers are made in a matter of minutes with "snap-action" connectors. Assistant Editor Ted Meinhold talked to Lilly process engineer Ralph Truax, describes the layout in April's "New Solutions" section.

Here's a quick preview
of features you'll find
in April CHEMICAL PROCESSING



Discolored plasticizer vs tech service

A vinyl converter making film and sheeting decided to make his own plasticizer — di-isooctyl phthalate. But things didn't go as well as they might. Product's color was poor and equipment corroded badly. Company had a consultant look things over, its own technical men reviewed the process, and plant operations were altered to correct the difficulties. But all to no avail.

Associate Editor Gordon Weyermuller tells how Enjay Lab technical service personnel entered the picture and worked with the converter's management and technical people until they had solved the mystery. Gordon is pictured as he confers with Enjay's John P. Thorn (center), Group Leader, and Erving Arundale (right), Assistant Lab Director. The complete story is a "New Solutions" feature next month.

Compact heat exchangers cut space needs

With over 200 chemicals in production — and more on the way — Eli Lilly's Chemical Manufacturing Department has to make the most of its equipment and limited floor space. A big problem has been condensers and heat exchangers. Not only did size and construction limit application to different processes, but units needed a lot of room.

Small, efficient graphite exchangers have changed all this. The 15" cubes provide 50 sq ft of transfer surface . . . require only 1/8 the floor space needed for conventional units.

Lilly now has a total of nine of these mites handling such materials as thionyl chloride, phosgene, ether, alcohols. Assistant Editor Ted Meinhold developed a story on their use, with the aid of Dr. Fredric R. Lloyd, Manager of the Chemical Manufacturing Department. It's a "New Solutions" feature next month.



This Ell Bolt is the Key to leak control

The patented Ell Bolt construction employed on Vogt floating head heat exchangers is the answer to re-assembly without distortion or leak development.

Cover may be removed by simply loosening the Ell Bolt nuts and disengaging the Ell Bolt heads from the "lock notches." No misplacing of Ell Bolts can result — and tightening is easy and positive — absolutely leak proof. Send for Bulletin HE-6. Address Dept. 24-XCP.



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Fittings and Flanges in a
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Plant Equipment • Steam Generators •
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SALES OFFICES: New York, Chicago, Cleveland, Dallas, Philadelphia,
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HEAT TRANSFER EQUIPMENT

When inquiring check CP 3991 opposite last page



Employing up-to-the-minute handling techniques and design, International Salt's new Chicago warehouse receives shipload quantities of up to ten types and sizes of salt . . . and distributes lots as small as 25 pounds. Handling 60,000 tons per year, this edifice provides virtually . . .

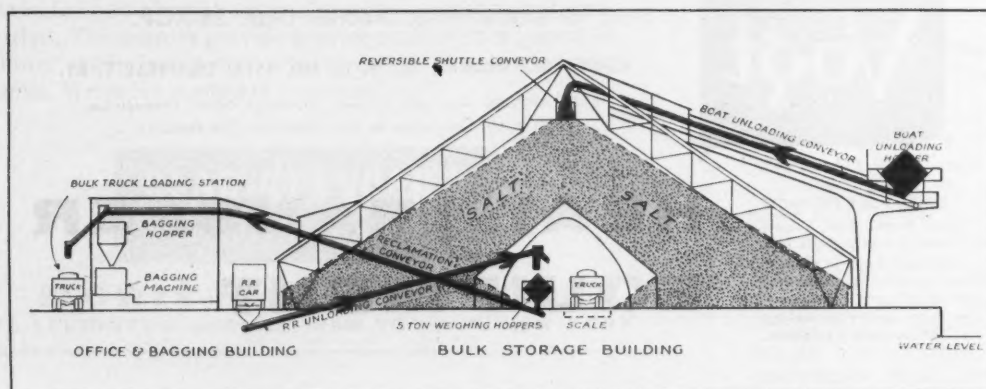
automatic from boats



Incoming material is normally handled by boat's self-unloader

Maintenance man adjusts take-up on shuttle conveyor which runs length of building. Shuttle permits salt to be deposited at any point in warehouse

Colored area shows location and flow of material



BILL SCHREMP, Assistant Editor
With **JOHN RAVEN**, Warehouse Superintendent
International Salt Company
Chicago, Illinois

When designing its Chicago warehouse, International Salt Co., largest US producer of salt, was seeking the utmost in material volume, handling speed and personnel safety. Also of prime concern: relatively small storage area, good product separation and freedom from contamination, favorable insurance rating and low maintenance costs. Result of this planning is an operation where material is handled manually only once — by tractor-shovel — from the time it is received until the finished bag is loaded onto pallet.

Salt Dictated Design

Roof of building conforms to salt's 32° angle of repose. Handling operations take place in a tunnel, running under heaped salt for the entire length of building. Tunnel permits automatic delivery by gravity of 2/3 of stored product. It works on the same general principle as a poultry feeder in which feed is automatically delivered to trough from the reservoir jar. Building is constructed primarily of timber and reinforced concrete.

Incoming material may be received from self-unloading lake freighters, general cargo ships, river barges, from any type of railroad equipment, or if necessary, from transport trucks.

Water-borne cargoes enter warehouse via loading hopper located opposite center of building on the dock side. From hopper, salt is uniformly fed onto 48-inch (1250 tph) inclined belt conveyor. On inclined conveyor, material travels to peak of building where it is transferred to shuttle conveyor — key to the whole system.

**new solutions
of processing problems**

handling to bags

Shuttle conveyor is 84-foot unit, traveling length of warehouse on rails. Material drops onto shuttle through divided chute, preventing pile-ups by deflecting flow in direction of belt travel. Troughed, 48-inch belt is reversible. Conveyor discharges into divided chute for delivery to bins on either side of handling tunnel. By use of this shuttle, material may be deposited anywhere throughout entire length of building.

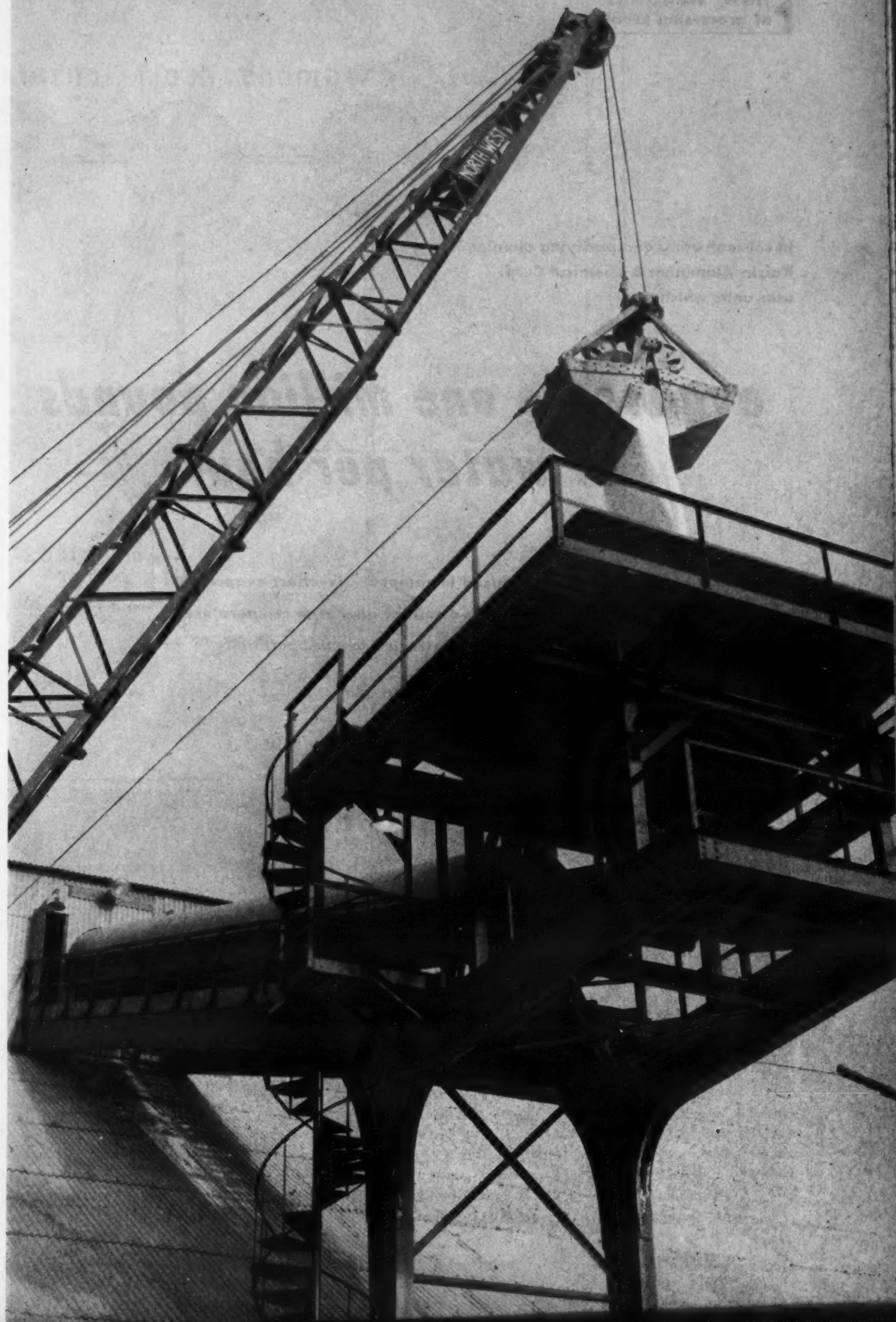
Material from piles is available to tractor-shovel through bin openings at floor of tunnel. From this point salt can go in either of two directions — 1) to weigh hoppers for subsequent bagging or bulk shipping or 2) it may be loaded directly into trucks at periods of peak demand.

In normal operation, tractor-shovel loads material into two five-ton weigh hoppers located at center of building. Weight is indicated at loading point on visible dial and is recorded on weight printer in shipping office. After weighing, salt drops to reclamation conveyor for delivery to bagging building. At this point material can be directed to automatic bagging scale or through bulk-loading chute outside of building.

During bad weather periods when salt demands for ice melting shoot up, trucks may be loaded directly on 10 x 50-foot truck scale in handling tunnel. Here, also, weight is shown on dial at scale and printed on ticket in shipping office.

(Conveying equipment was designed and built by Hewitt-Robins, Inc., Dept. CP, 270 Passaic, Passaic, N.J. . . . or for more information check CP 3992 on form opposite last page.)

Clamshell unloads salt from barge at dockside — delivers it to loading hopper for incoming material. Salt enters building in 48" troughed conveyor



**new solutions
of processing problems**

In concentrating and purifying alumina,
Kaiser Aluminum & Chemical Corp.
uses units which —

evaporate one million pounds of water per hour

*Fouling is minimized in compact, six-effect evaporators
which are designed so that discharge temperature
is low and can be varied to suit operations*

GORDON WEYERMULLER, Associate Editor

AT ONE of the country's largest alumina plants at Baton Rouge, Kaiser Aluminum & Chemical Corp. evaporates 1,000,000 lb of water per hour by means of six multiple-effect evaporators. Of these, four six-effect units were placed in operation in the fall of 1953. The other two units, each of which also has six effects, were installed in 1943 when plant was built. The newer units each have a capacity of 200,000 lb per hour and the other two, 150,000 lb per hour, making a total capacity of 1,100,000 lb per hour.

Unusual evaporator scheme, as shown in above diagram, provides economy, compactness, and minimum fouling among other advantages. As shown, feed liquor enters both ends of evaporator, condensate passes straight through from No. 1 to No. 6 effect, while product is taken from No. 3 and 4 effects.

One advantage of the design is the low discharge

temperature obtained that can be varied to suit other operations. This is achieved by the use of three external flash chambers for final product. In this way, last portion of evaporation is done out of contact with heat transfer surface. This also minimizes fouling in the product effects, viz No. 3 and 4. Purpose of the evaporators is to control the volume and concentration of the process liquor during the purification of alumina. Feed liquor concentration of spent sodium aluminate is 130 to 140 gm/l as NaOH. Discharge liquor contains 190 gm/l as NaOH.

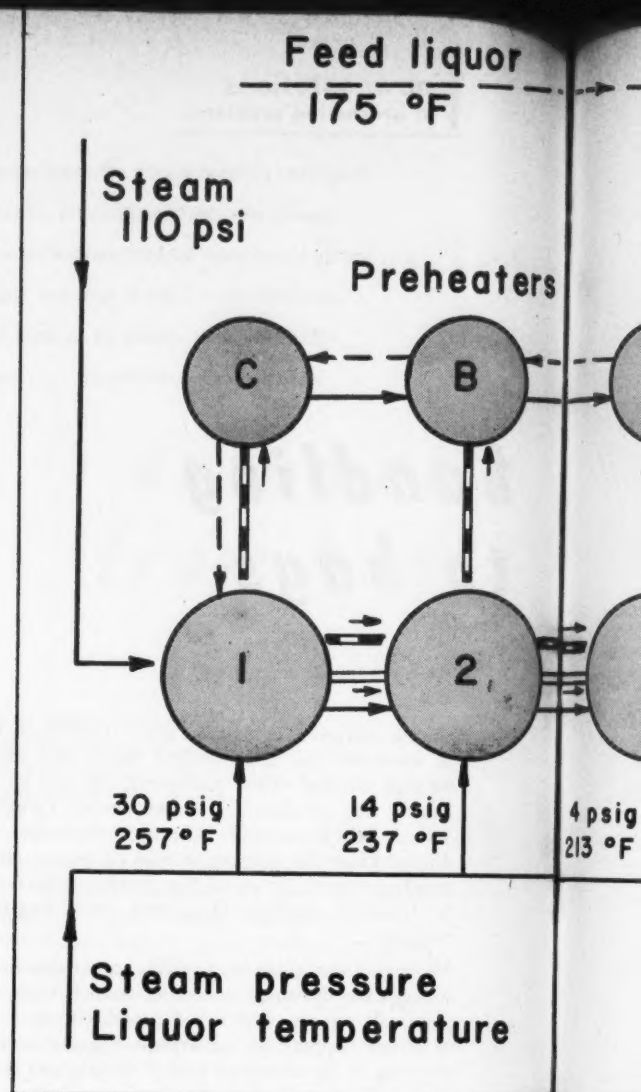
For condensation, about 35,000 gph of water from the Mississippi River is used. Evaporator condensate is used for boiler feedwater. For this use it is necessary that the condensate carry as little entrained liquor as possible. Condensate contains 0.016 gm/l as NaOH.

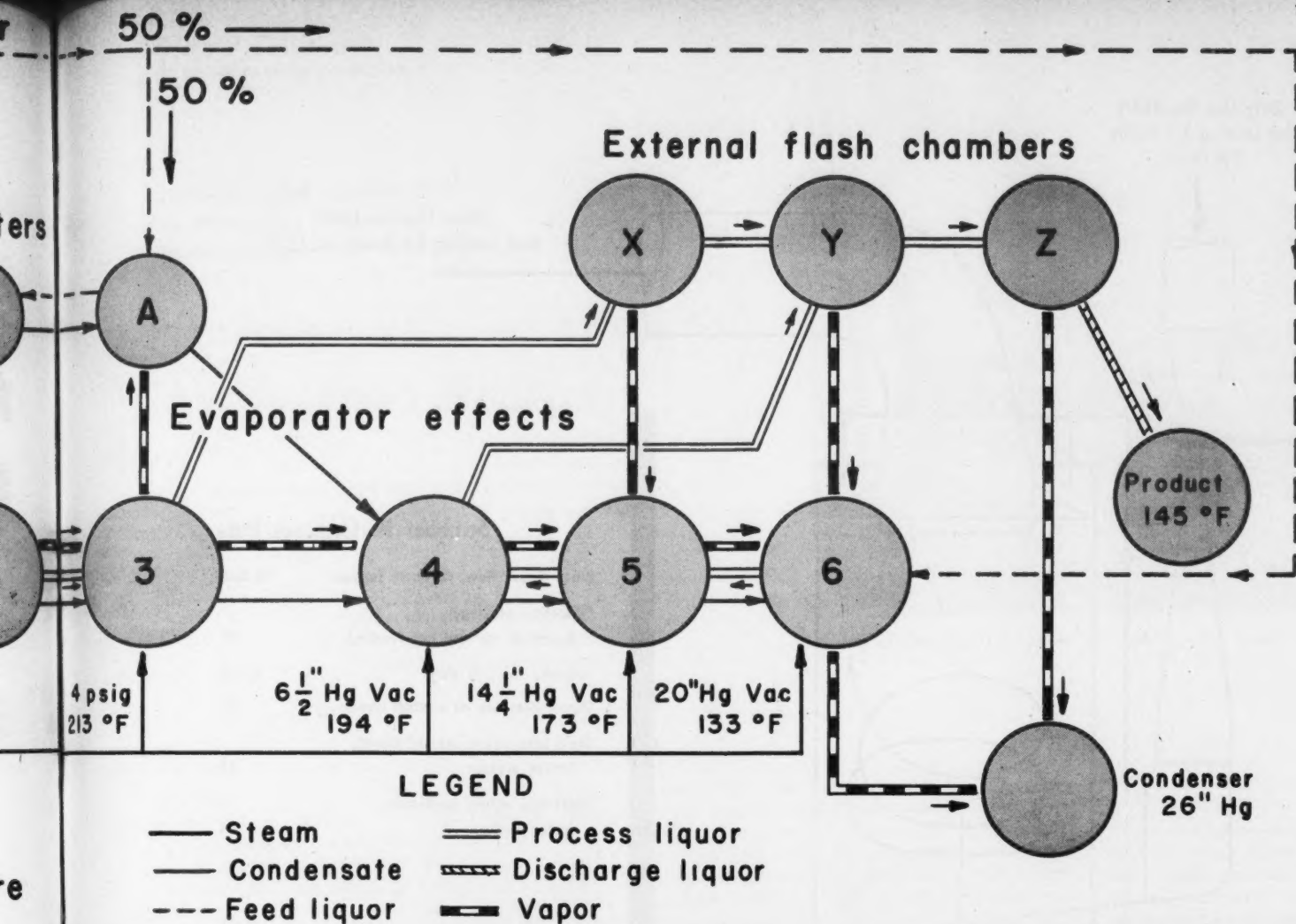
Evaporators have automatic pressure control and

flow recorders for steam to first effect. Automatic flow control is provided for feed to first and sixth effects. Speedomax intermittent analyzer furnishes automatic rejection of high soda condensate. Liquor concentration is measured by instrumentation and many temperature recorders are used.

Compactness of the units is shown by the fact that all six evaporators fit in a small piece of property, about 80 x 125 feet. Units operate with an economy of 4.3 lb of water evaporated per lb of steam. Evaporators are cleaned about every 30 days. This is necessary because of the high steam pressure (110 psi) used.

(Multiple-effect evaporators are product of Goslin-Birmingham Manufacturing Company, Inc., Dept. CP, 3523 10th Avenue, North, Post Office Box 631, Birmingham 1, Alabama . . . or for more information check CP 3993 on form which is located opposite last page.)



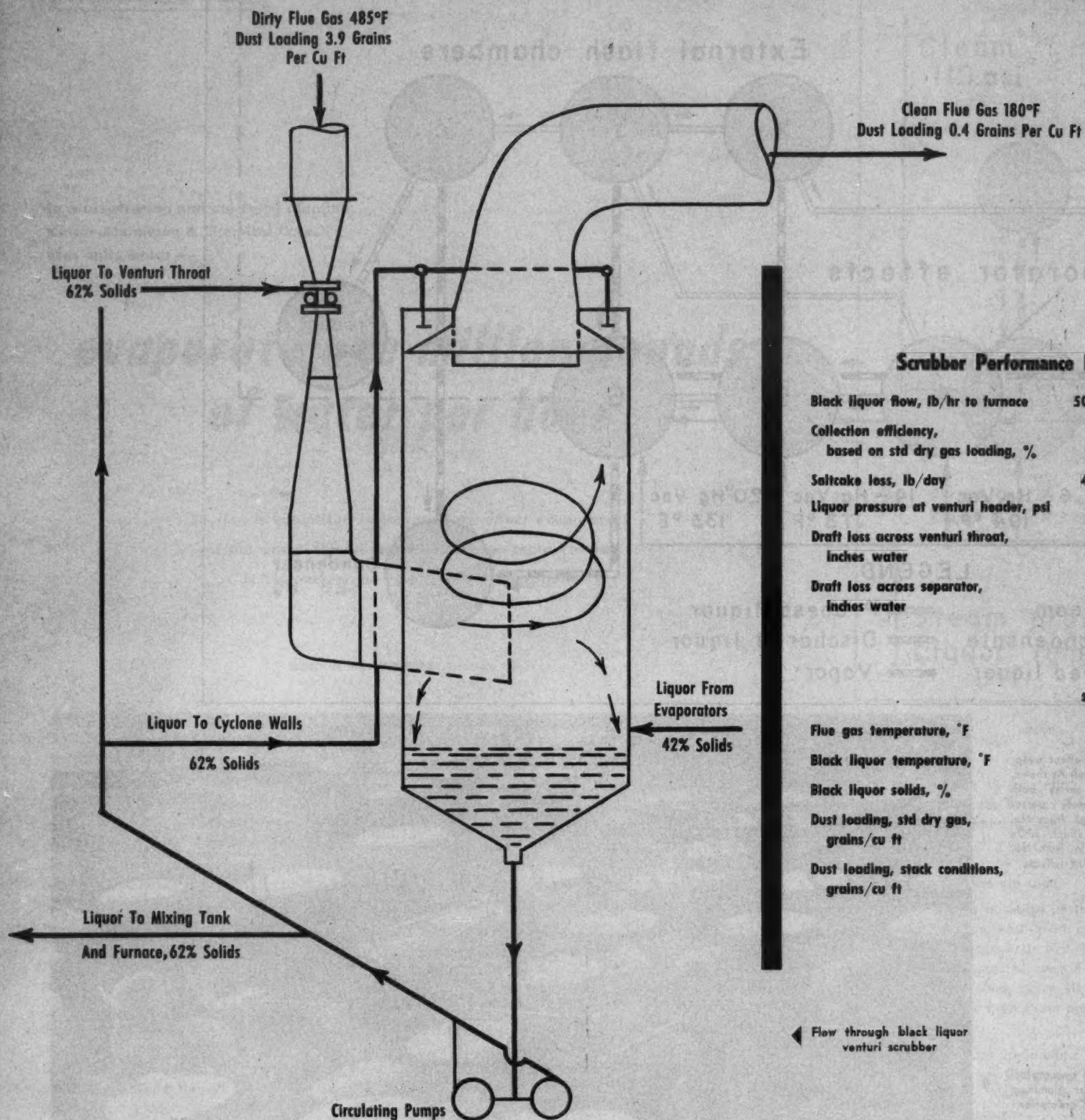


▲ Scheme of six-effect evaporator is unusual. As shown, feed liquor enters both ends, condensate passes straight through from No. 1 to No. 6 effect, while product is taken from No. 3 and No. 4 effects

Multiple-effect evaporators in use at Kaiser Aluminum & Chemical Corporation

CP Staff Photo





Scrubber Performance Data

Black liquor flow, lb/hr to furnace	50,000
Collection efficiency, based on std dry gas loading, %	89
Saltcake loss, lb/day	4,500
Liquor pressure at venturi header, psi	30
Draft loss across venturi throat, inches water	30
Draft loss across separator, inches water	4

	To Scrubber	From Scrubber
Flue gas temperature, °F	485	180
Black liquor temperature, °F	190	180
Black liquor solids, %	42	62
Dust loading, std dry gas, grains/cu ft	5.87	0.66
Dust loading, stack conditions, grains/cu ft	3.90	0.40

**Thilmany installs scrubber that
simultaneously concentrates black
liquor, recovers waste heat, and . . .**

reclaims 90% of chemicals from flue gas

**Venturi-type unit uses process liquor instead of water,
saves over 3000 lb steam per hour**

TED F. MEINHOLD, Assistant Editor
verified by **P. H. WEST, Pulp Mill Superintendent**
Thilmany Pulp and Paper Company

Problem: When Thilmany Pulp and Paper Company, Kaukauna, Wisconsin, boosted their pulp production to 165 tons per day, a few years back, they realized that their black liquor recovery system could not keep up with the pace. Since black liquor solids per ton of pulp were 10% higher than normal, solids equivalent to over 180 tons of production were being sent to the system daily. This was considerably more than it was capable of handling, so the recovery operated an extra day each week to process the surplus black liquor accumulated during the week, and occasionally it was necessary to sewer liquor.

Since the system recovered both heat and chemicals from spent liquor, increased sewer losses also meant lower heat and chemical recovery. Although the 120-ton recovery furnace was able to incinerate and smelt chemical from most of the liquor returned, its total steam production (6500 lb at 200 psi per ton of pulp) could not be increased and was not enough to meet the increased demands. Evaporators were severely taxed. Despite 90% recovery of soda from furnace stack gases by a water venturi scrubber, saltcake makeup also increased, primarily due to increased sewer losses.

Solution: After studying the problem, it was decided to install a 250-ton, 600-psi, Babcock & Wilcox recovery unit equipped with a *black liquor* venturi scrubber. The scrubber as originally developed by Pease, Anthony Equipment Company, Newtonville, Massachusetts, and Babcock & Wilcox Co.

in conjunction with Thilmany, and installed on the 120-ton recovery boiler, used water as scrubbing medium. The venturi scrubber on the new unit uses black liquor for scrubbing, making it possible to clean the flue gases, lower their temperature, and further concentrate the black liquor at the same time.

Scrubber consists of a 2/3' x 7 1/2' rectangular venturi atomizer and a 15' diameter x 45' high cyclone separator. Black liquor at 42% solids (from evaporators) is fed into the base of separator through a float valve. Entering the unit, it mixes with higher-concentrated circulating liquor and attains system equilibrium concentration of about 62% solids.

A 2000-gpm centrifugal pump circulates the liquor from the base of the cyclone to the venturi throat and to the wall-washing nozzles at top of unit. Proportions are adjusted so that for every six gallons pumped from the base, four go to the venturi, one goes to wet the cyclone walls, and one to a mixing tank enroute to the furnace. Pump is equipped with an 8" basket-type strainer. Spare pump and strainer insure continuity of service. Motor-driven scrapers remove the solids from strainers and feed them to the mixing tank with the liquor going to the furnace.

The circulating black liquor enters the venturi throat through a series of small orifices from a header on each side of the throat. Liquor is further atomized by the dust-laden flue gases passing through the throat at high velocity. The dust particles are picked up by the atomized droplets of liquor, and the heat absorbed from the dust and gas flashes off part of the

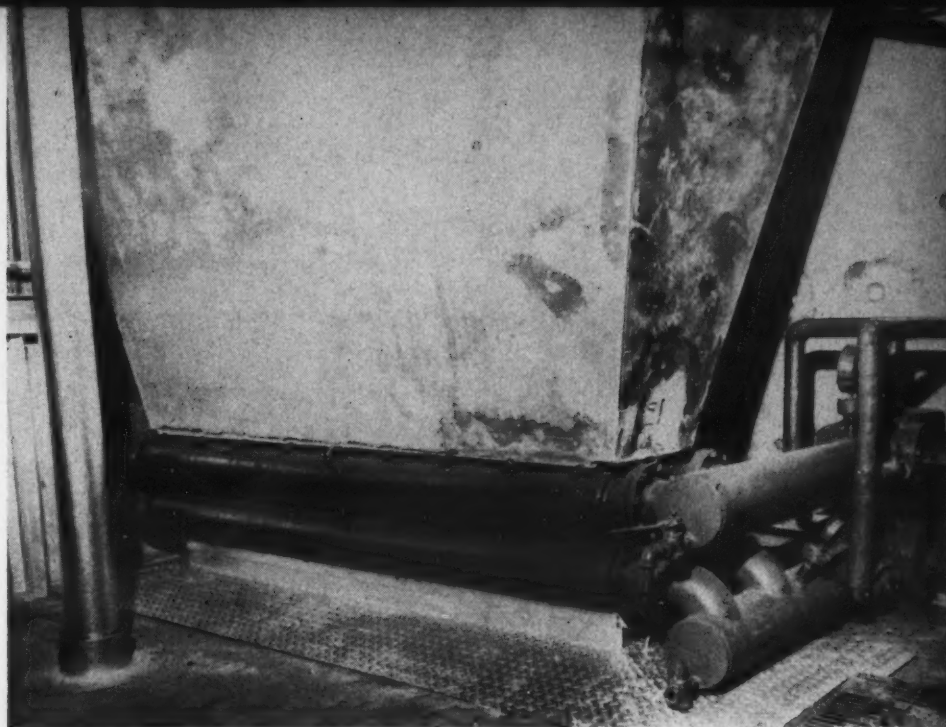
liquor. Gas temperature is reduced from 485° to 180°F in the scrubber.

Mixture of gas, vapor, and liquor enters cyclone separator where liquor and collected chemicals are centrifugally removed from gas stream. Separated material runs down cyclone wall. Clean, saturated gas leaves top of separator through two 100,000-cfm induced draft fans. Units, run in series, develop 40" static pressure, and discharge gas into 200' stack.

Results: Flue gas leaving scrubber has concentration of 0.4 grains dust per cu ft, as compared to entrance concentration of 3.9 grains — resulting in chemical recovery efficiency of 90%. Heat recovered is sufficient to eliminate evaporating 12,000 lb per hr of additional water in the evaporators — saving more than 3000 lb steam per hr. Unit operates automatically and needs no operating attention other than an hourly check of the liquor atomizing pressure at the venturi throat. The fact that the chemical is collected directly by the black liquor, where it is ultimately wanted, simplifies the overall operation.

Scrubber has been in operation over two years (pulp production was increased to 225 tons per day during first year). The one disadvantage, high power requirements, is believed to be more than overcome by good heat and chemical recovery, low cost, and low space requirements.

(Black liquor recovery system was installed by Babcock & Wilcox Co., Dept. CP, 161 E. 42nd St., New York 17, N.Y. Check CP 3994 opp. last page.)



Closeup of venturi throat and header. Extra header permits cleaning without shutting down



**new solutions
of processing problems**

More modern method is developed for soybean processing as rotary dryers, in addition to drying, are also used to —

cool and condition soybean material

**Uniform operation, low maintenance,
and improved efficiency are achieved**

GORDON WEYERMULLER, Associate Editor

With **MAX R. SPENCER**, Plant Production Engineer
Central Soya Company, Inc., Chattanooga, Tenn.

PROBLEM: Former method of drying, conditioning, and cooling soybean material at Central Soya Co. was not as efficient nor did it provide as close control of variables as was desired. In some cases, soybean meal could not be cooled to a low enough temperature, which caused it to cake in storage and created problems in feed manufacture. Maintenance costs were excessive on former equipment.

SOLUTION: In their new plant at Chattanooga, Tenn., which went into operation in April 1955,

Central Soya installed four large rotary dryers to cool and condition soybean material as well as to dry it. One is used for drying, one for conditioning, and two for cooling. Details of how each of the four black iron units is used follow:

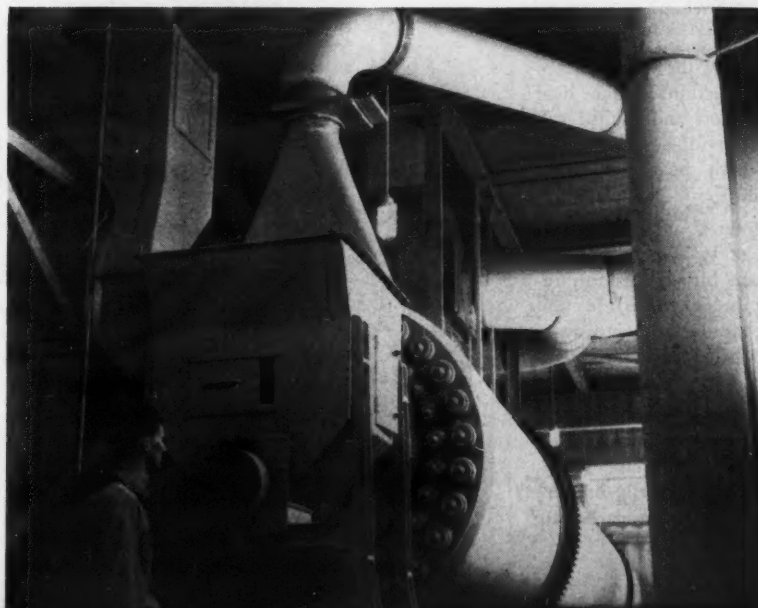
First Unit—This unit (shown in Fig 1) is used early in process to heat and condition soybeans coming from cracking rolls and dehullers, prior to extraction. This 6 x 50' dryer is equipped with steam tubes and flights. About 21 tons of material enter at room temperature and are raised to about 160°F.

Second Unit—This dryer (third unit from the left in Fig 2) is used for drying soybean meal, which enters at 210-215°F. Hot, wet soybean meal

(Please turn to page 20)

Fig 1—This unit is used for conditioning soybeans prior to extraction
CP Staff Photo

Fig 2—Soybean meal coming from extractor section at right enters three rotary units (left) in turn, for drying and cooling



NEW SOLUTIONS

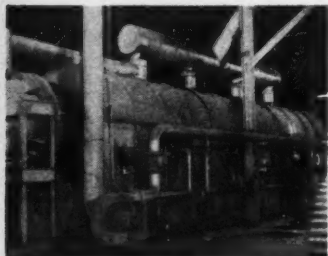
Low maintenance results with indirect-fired rotary dryer . . .

handles 3000 lb of $MnCO_3$
per hour

Problem: Manganese carbonate to be dried at Manganese Chemicals Corp., Riverton, Minn., could not be brought into direct contact with products of combustion due to the fineness of the material. A slurry consisting of 70% carbonate and 30% mother liquor (water, ammonia, and carbon dioxide) had to be handled. Bone dry product was required for final discharged material.

Solution: In Sept. 1954 an indirect-fired dryer consisting principally of a 4' ID stainless steel cylinder, housed in an insulated refractory-lined furnace, was placed in service.

Wet material enters cylinder by means of a feed chute. Spiral



High quality of product maintained by dryer at Manganese Chemicals

flights advance the material to heated active section. Radiant heat is supplied below and against cylinder by means of a series of oil burners, which heat the dryer shell to 600°F.

Cylinder rotates at 4 rpm and has a slope of $\frac{1}{8}$ " per foot. Purging gases are blown through inside of cylinder to dilute and remove evaporating moisture. Time of passage for material is 30 minutes.

Results: Dryer has been very good with respect to maintenance, according to plant superintendent. It satisfactorily handles 3000 lb of manganese carbonate

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the cellular, stay-dry insulation



STAYS DRY—Cut a piece from your sample. Place it in water. Note how the hermetically-sealed glass cells filled with dead air keep it afloat. Weight it down for days, weeks or longer

if you like. Remove the weight and it bobs back to the surface . . . proof that the sealed cells have absorbed no water, still have their original insulating efficiency.

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STRONG AND RIGID — Place your FOAMGLAS block on the floor. Stand on it. Note how it supports your weight without crushing. Compressive strength is over seven tons per square foot . . . making it ideal for load bearing applications.

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Thousands of actual users have proved in actual performance the benefits so clearly demonstrated by these tests. No wonder, then, that new users every

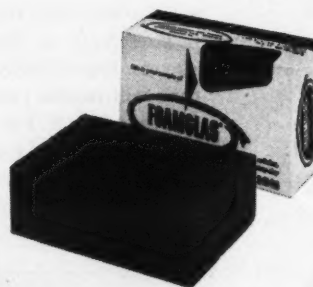
day are picking FOAMGLAS to insulate the roofs, ceilings, walls and floors of all types of buildings, low temperature spaces, piping and equipment. Send for a sample today and make your own tests. Use the handy coupon, or write . . .

Pittsburgh Corning Corporation

Department CP-36, One Gateway Center
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Please send me a sample of FOAMGLAS for testing.

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Company _____ Title _____
Address _____
City _____ Zone _____ State _____

per hour and maintains the high quality of the product.

(Style D indirect heat dryer is a product of The C. O. Bartlett & Snow Co., Dept. CP, 6200 Harvard Ave., Cleveland 5, Ohio . . . or for more information check CP 3995 on form opposite last page.)

Protection with a flair — aluminum paint in colors . . .

applied by brush or spray;
durable and high covering

Southern California Edison Company has given its Los Angeles plant the protection of an aluminum coating on tanks, structures, and stacks, and achieved an eye-catching, landscape-blending color scheme as well. Aluminum paint in green, blue, and gold, which can be brushed or sprayed without blotching or "floating" colors, provides good resistance to moisture corrosive fumes, and sun.

Paint film consists of overlapping layers of metal flakes, five to ten layers thick, cemented together by a lasting watertight vehicle. A single coat will cover and hide even a colored surface. Inspection of the film after two years exposure shows no sign of fading or deterioration.

(Patent on their color process for Alumizol® colored aluminum paints has been applied for by Gilmore and Nolan, Inc., Dept. CP, 1451 S. Lorena St., Los Angeles 23, Calif. . . . or for more information check CP 3996 on convenient form opposite last page.)

(Aluminum pigment for Alumizol coatings is supplied by Aluminum Company of America, Dept. CP, Pittsburgh 19, Pa. Check CP 3997 on form opposite last page.)

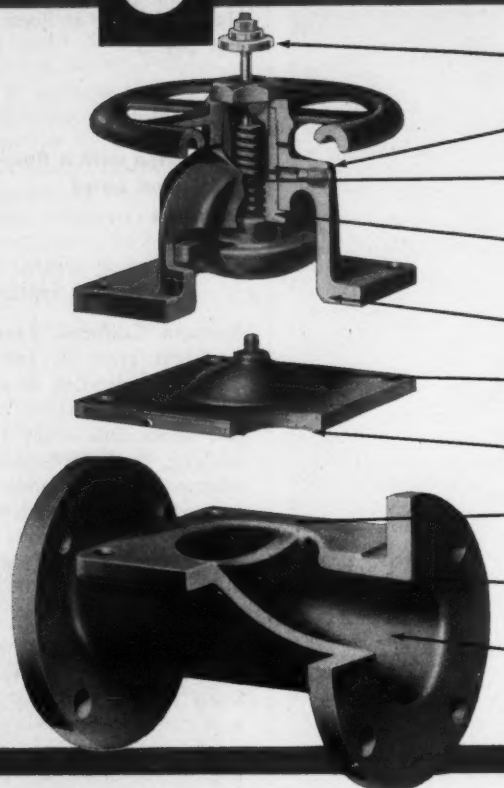
For more information on product at left, specify CP 3998 . . . see information request blank opposite last page.

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- 1 **TELL-TALE TRAVEL STOP** shows position of diaphragm; prevents possible damage to diaphragm that could result from overclosure.
- 2 **CHOICE OF 36 BONNET ASSEMBLIES** assures a means of operation best suited to your requirements.
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- 10 **SELF-CLEANSING** characteristic is made possible by absence of pockets, corners, grooves and sharp changes in direction.

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HILLS-McCANN A

Corrosion Specialists

Since 1870

NEW SOLUTIONS of processing problems

Rotary Dryers

(Continued from page 17)

comes from desolventizer-toaster and goes through wet grinder to break up large balls to aid in drying. From grinder, material passes into this unit, which is 8' in diameter and 50' long.

Dryer is equipped with horizontal steam tubes and some flights. Air is pulled through dryer. Material leaves with a moisture of 10-12%. Unit handles 17 tons per hour.

Third Unit—Material is discharged from first dryer into vertical elevator which takes it to classifying screens. It then passes through two hammer mills and goes to second rotary unit (second from left in Fig 2) which is known as the air meal cooler. This unit has a 10' diameter x 45' long hollow shell, with lifting flights. Air is drawn through meal for cooling. Soybean meal enters at about 135°F and leaves at 85 to 100°F.

Fourth Unit—Soybean meal now enters 6 x 50' water tube cooler (far left in Fig 2) which contains seamless steel black iron tubes through which chilled water is passed for cooling. Meal comes out of this unit at 60 to 70°F and goes to storage.

RESULTS: With present drying, cooling, and conditioning setup, operation is more uniform and the variables are easier to control. This contributes to the manufacture of a high-quality product and is a considerable advance in soybean processing. Temperature of finished material is easily lowered to 60 to 70°F so that caking is avoided in storage. Operation in general is more efficient. Since the rotary units have no internal moving parts and are simply constructed, there is not much that can go wrong. Only a minimum of maintenance has been required.

(Rotary units are product of Louisville Drying Machinery Unit, General American Transportation Corp., 139 S. Fourth Ave., Louisville 2, Ky. . . . or for more information check CP 4000 on form opposite last page.)

Deals with naphtha reforming

Economic advantages of naphtha reforming process using platinum catalyst for producing low cost, high octane reformate are described in eight-page booklet. Catalyst can be regenerated to provide many operating cycles, with negligible loss in catalyst activity. Literature includes flow diagrams and operating cost summaries.

Booklet "Low Cost Production of 95 Octane Clear Reformate" is issued by Refinery Process Div., The M. W. Kellogg Co., Dept. CP, 225 Broadway, New York 7, N.Y. When inquiring specify CP 4001 on form opposite last page.

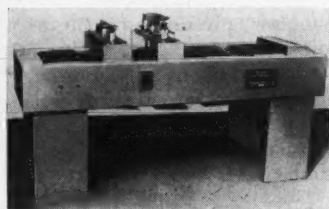
When inquiring check CP 3999 opposite last page

**Machine automatically cuts,
"cracks off" glass . . .**

handles nearly 1200 pieces
per hour

Replacing time-honored hand operations in glass production, a machine has been developed that automatically cuts and "cracks off" glass. It can handle up to $\frac{1}{8}$ " plate glass and cut circles and other patterns from 2" to 6" diameter. Capacity of machine is nearly 1200 pieces per hr — a boost of almost 100 percent over present hand operations.

In operation, plate glass is fed into machine from right-hand side where it is automatically engaged and scored by a steel cutting wheel assembly. Moving to the left, the glass comes into contact with a




Machine replaces time-honored
hand operations in production
of glass

second fixture which exerts controlled amount of pressure on the glass, causing the cut to flow. Continued pressure breaks up unwanted glass. Scrap is chuted to waste receptacle.

Machine is driven by a $\frac{1}{2}$ -hp motor through a gear train and Geneva drive enclosed in an oil-tight case. Chain drive furnishes power to cam sets which control cutting and breaking operations.

(Automatic glass cutting machine was developed by Biddle Engineering Company, Dept. CP, P. O. Box 98, Warrendale, Pa. . . . or for more information check CP 4002 on form which is located opposite last page.)

For more information on product at right, specify CP 4003 . . . see information request blank opposite last page. 

FAMOUS LIGHTHOUSES OF AMERICA



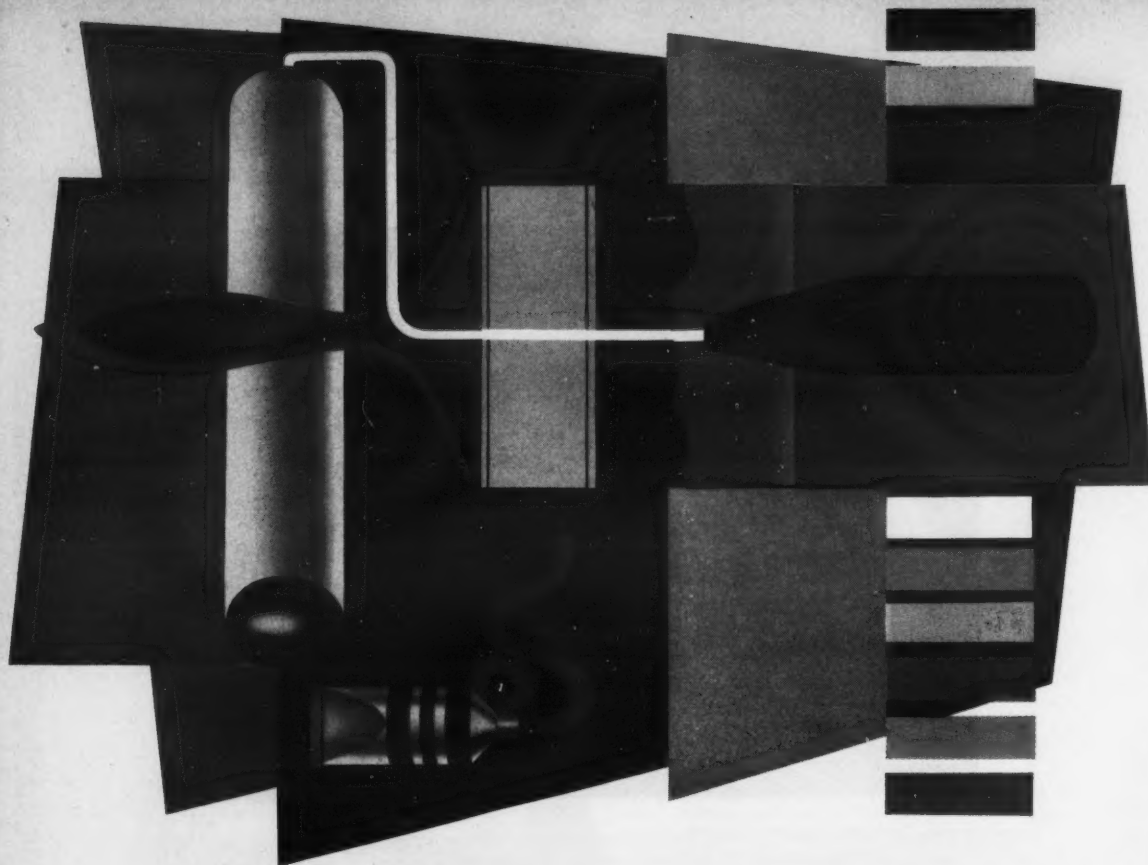
FOWEY ROCKS LIGHTHOUSE is situated on the outer reefs 11 miles southeast of Miami, Florida. Built in 1878, it is of iron pile construction and stands in 4 feet of water with the light itself 110 feet above water. Fowey Rocks Lighthouse is one of a series of great offshore lighthouses that have made navigation safer and helped to eliminate an infamous wrecking industry that once thrived along the dangerous Florida Reefs.

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60 East 42nd Street
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What can **YOU** learn from the people who make paint?

If you have joined the do-it-yourself movement in the matter of decorating, you know that handling paint can be a ticklish business. Consider, then, the job that men who manufacture paint must tackle—

thousands of gallons in a batch and hundreds of colors to worry about.

When paint manufacturers look for a fabricator of process equipment, they turn to a specialist in the field—Chicago Steel Tank Company.

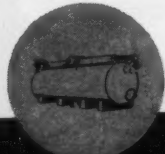


Write for booklet which illustrates and describes C.S.T.

If you require pressure vessels, atmospheric tanks or other special alloy equipment, see us when your next job comes up.

You'll find the type of people at C.S.T. who understand your problems, speak frankly on matter of delivery and know how to conform to strict manufacturing codes.

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When inquiring check CP 4004 opposite last page

NEW SOLUTIONS of processing problems

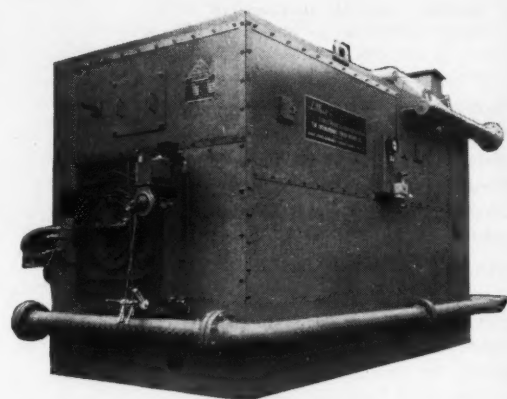
Flexibility, close temperature control provided by kettle heating system in resin plant . . .

jacket temperatures varied from room temperature to 600°F, accuracy controlled within $\pm 2^\circ\text{F}$

Problem: When Marshall-Eclipse Division, Bendix Aviation Corporation, Troy, New York, was designing its new resin manufacturing plant, engineers were looking for an efficient way to heat their processing kettles. Since various types of resins would be produced, the system had to be flexible. Engineers wanted a system which could obtain jacket temperatures ranging from room temperature to 600°F — with simple, accurate instrument control over the entire range.

Solution: A thermal liquid recirculation heating system was selected for the process. Designed for continuous operation, the system heats two kettles, each having 8500-9000 lb working capacity, by pumping hot thermal liquid through their jackets. Aroclor 1248 (a chlorinated diphenyl) is the liquid used here.

System operates at low pressures (20-30 psi) without vapor formation. One kettle takes its thermal liquid directly from the main loop through a control valve. A secondary loop takes hot liquid from the primary loop, through a thermostatically-controlled valve, through a pump, and back to main loop. Thermostat takes signal from thermal



Heater is especially designed for high temperature heat transfer liquids

liquid in secondary loop. Liquid in secondary loop circulates through second kettle jacket or through a by-pass, depending on demands of a thermostatically-controlled valve which takes its signal from the kettle contents.

Heart of system is a LaMont forced-circulation thermal liquid heater especially designed for high temperature heat transfer liquids. By forced circulation, fluid velocities of 5' to 8' per sec are maintained eliminating the inherent danger of

overheating and subsequent fluid decomposition due to sluggish circulation. Small diameter tubes are utilized which with orificing assures equal distribution of liquid, uniform heating, and high rates of heat transfer.

Heater is oil fired, has a capacity of three-million Btu per hr, contains 600 sq ft of heating surface, and holds about 800 lb of Aroclor. Furnace volume is approximately 162 cu ft.

Results: Jacket temperatures as high as 550°F, with accuracy of plus or minus 2°F are maintained without difficulty. Batches are cooked in five to eight hrs, and during dehydration, 3000 lb of water are removed in as little as 2¾ hours. Cooking time, of course, is determined by characteristics of resin. Temperatures at the kettles normally range up to 300°F, but higher temperature (up to 500°F) necessary for cooking ester-type resins can also be reached. Use of Aroclor also minimizes fire hazard.

(International-LaMont Type LFH-3 Thermal Liquid Heaters are product of The International Boiler Works Company, Dept. CP, East Stroudsburg, Pa. Check CP 4005 opposite last page.)

(Aroclor 1248 thermal liquid is product of Monsanto Chemical Co., Dept. CP, 1700 S. 2nd St., St. Louis 4, Mo. Check CP 4006 opp. last page.)



**WANTED:
BUDDING
CARTOONISTS!**

CHEMICAL PROCESSING is in the market for cartoons (and cartoon ideas). They should touch on some aspect of chemical plant or lab work.

Worth \$10—Cartoons in black ink on 8½ x 11" sheets—ready to reproduce—will be bought for \$10, paid on acceptance.

Worth \$5—Cartoon ideas . . . a written description or rough sketch of scene, and a caption . . . worth \$5, on acceptance.

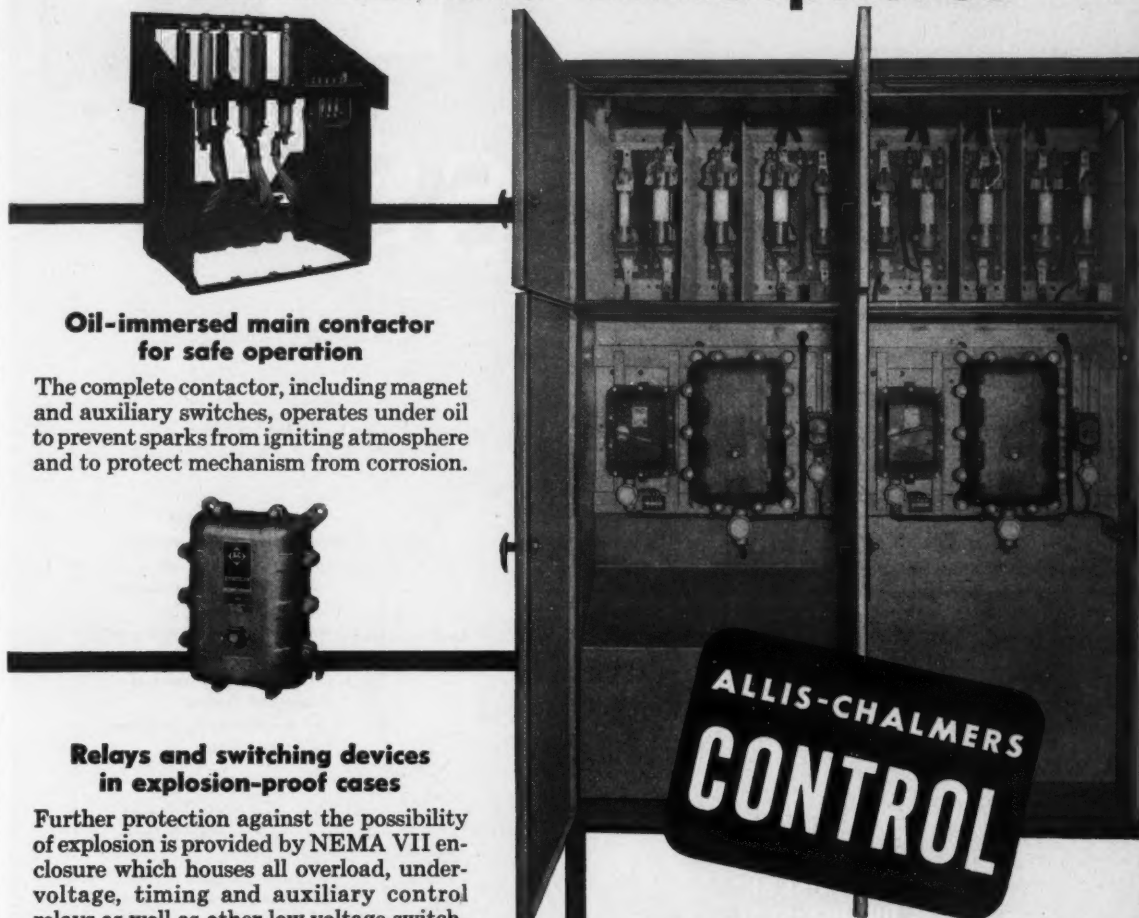
Send your gag material to:

Cartoon Editor, CHEMICAL PROCESSING
111 East Delaware Place
Chicago 11, Illinois

Be sure to include your name, position, company, and address.

These Safety Features

meet operating demands of combustible atmospheres



Oil-immersed main contactor for safe operation

The complete contactor, including magnet and auxiliary switches, operates under oil to prevent sparks from igniting atmosphere and to protect mechanism from corrosion.

Relays and switching devices in explosion-proof cases

Further protection against the possibility of explosion is provided by NEMA VII enclosure which houses all overload, under-voltage, timing and auxiliary control relays as well as other low voltage switching devices.

Interlocked fuse compartment door

The fuse disconnect door is interlocked. The line contactor must be opened before access to the fuse is possible.

Other features Steel barriers in rear compartment prevent accidental contact with high voltage parts. Enclosure is finished with corrosive-resistant paint. Indoor or outdoor control equipment may be provided.

A-4563

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Industry-Engineered
for Semi-Hazardous Locations

Type H starters for 2300 to 5000-volt motors

For complete information, see your Allis-Chalmers representative or write Allis-Chalmers, Milwaukee 1, Wis.



ALLIS-CHALMERS

When inquiring check CP 4007 opposite last page

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covered with fine synthetic
polyethylene, vinyl, neoprene
and other flexible films —
all of maximum 100% strength

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GENERAL OFFICES AND PLANT, 22 WOODHULL STREET, BROOKLYN 31, NEW YORK

NEW SOLUTIONS of processing problems

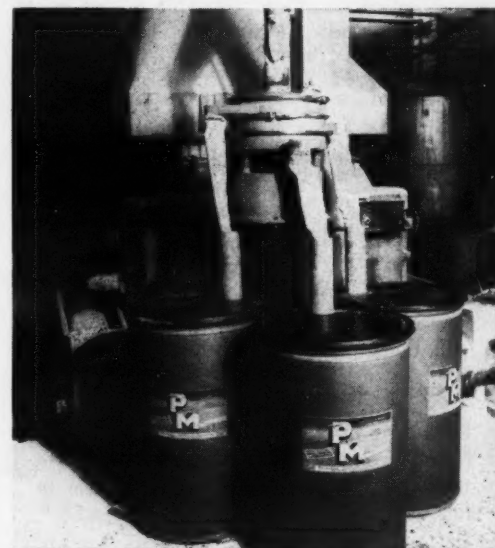
**Essential Chemicals ups capacity,
saves space, with vibrating
screen separator . . .**

unit gives dust-free operation 24 hours per day

Problem: Inclined screen used for classifying detergent base ingredient was a bottle-neck at Essential Chemicals Company, Fredonia, Wisconsin, who requires large-scale production for sale to other soap and detergent manufacturers. Not only did it fail to provide the maximum desired capacity, but the machine was dusty in operation, and occupied too much space.

Essential produces alkyl aryl sulfonate (sodium salt) for other soap and detergent manufacturers, which it markets and includes in detergents known as "Trust", "Deo-Fresh", "April", "D-Flox", and several private-label products for large detergent manufacturers.

Solution: In March 1955, company installed an 18" diameter vibrating-screen separator. They also purchased a 6 mesh (0.1318" opening), a 20 mesh (0.0340" opening), and a 24 mesh (0.0277" opening) market-grade cloth for use with the unit.



Vibrating-screen separator gives dust-free operation, classifies product into three fractions

Slurry is first fed to a rotary drum dryer. As it leaves the dryer's flaking roll, it drops to two conveyors which carry the flakes to an elevator. Elevator discharges material to hopper which feeds it to top screen (6 mesh) of the triple-screen separator. Fractions are collected in separate drums.

Results: Bottle-neck is eliminated and company has tripled its production capacity. Compact and dust-free, separator operates 24 hours per day with minimum attention. Screens can be easily changed

When inquiring check CP 4008 opposite last page

to meet various product specifications.

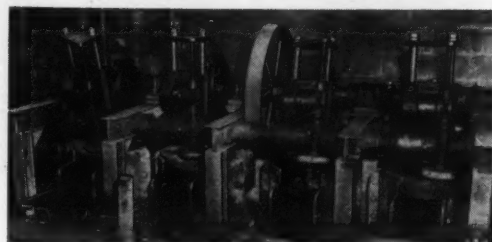
(Model H-2D Sweco vibrating screen separator is product of Southwestern Engineering Company, Dept. CP, 4800 Santa Fe Avenue, P.O. Box 58264, Vernon Station, Los Angeles 58, California . . . or check CP 4009 opposite last page.)

Recovery of fine coal from washery water aided by pump . . .

adjustable stroke unit permits control of density by varying volume during operation

Adjustable-stroke diaphragm pump aids in providing economical treatment method for recovery of fine coal from washery water solids at a plant of a large coal company in Pennsylvania. Unit controls slurry density in initial size separation phase of flotation plant, by permitting operator to vary flow volume of discharge to compensate for changes in composition of waste from breaker cleaning plant, without interrupting operations. Pump handles fine coal slurry at about 560 gpm to maintain solids content of 35%. Screen analysis of particle size ranges from 10 to approximately 200 mesh.

In initial portion of flotation process, waste water from breaker cleaning plant is collected and delivered at 7000 gpm through a 16" line to a 75' combination spiral and angle rake hydroclassifier. It contains about



Quadplex adjustable stroke diaphragm pump handles 35% solids

5% solids and is subjected to a sizing operation at roughly 200 mesh. Overflow from hydroclassifier contains excess water, colloidal slimes, and particles finer than 200 mesh. Underflow passes through adjustable stroke diaphragm pump, driven by 15-hp gearmotor. Pump discharge is maintained at 35% solids, the optimum for subsequent treatment. Diaphragm of pump is of molded rubber and is easily replaced by one man. Pumping volume is regulated by convenient hand wheel, and splash cover prevents liquid from entering mechanism. Hand wheel is located to allow adjustment of stroke, while unit is in operation, with no danger to operator.

(Adjustable stroke diaphragm pump is a product of Denver Equipment Co., Dept. CP, Box 5268, Denver 17, Colo. Check CP 4009A opposite last page.)



Is lack of power limiting centrifuge performance?

... then the Sharples DH-3 Nozljector is the centrifuge for your plant. The DH-3 is built for the toughest concentration and clarification jobs. Sharples first built a larger bowl for maximum efficient throughput, and then designed a special rugged spur gear drive to deliver up to 40 HP necessary to achieve peak performance under any operating conditions.

The DH-3 puts *more* horsepower, and *all* the horsepower where it belongs —into the centrifuge bowl. The result is greatly increased throughput and a consistently better job of clarifying or concentrating.

We'll be glad to show you the facts on your own material. A copy of Bulletin 1276 will be sent if you just drop us a line.



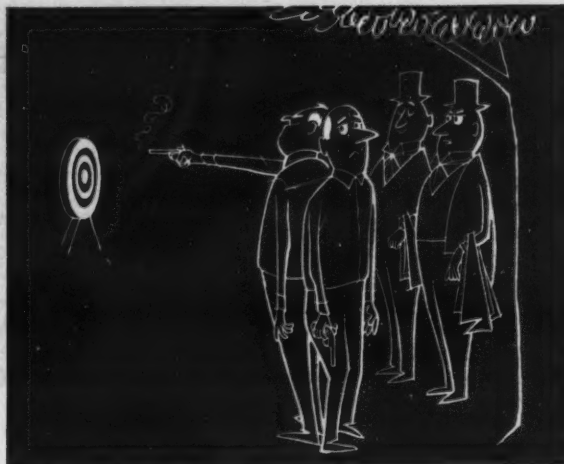
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When inquiring check CP 4010 opposite last page

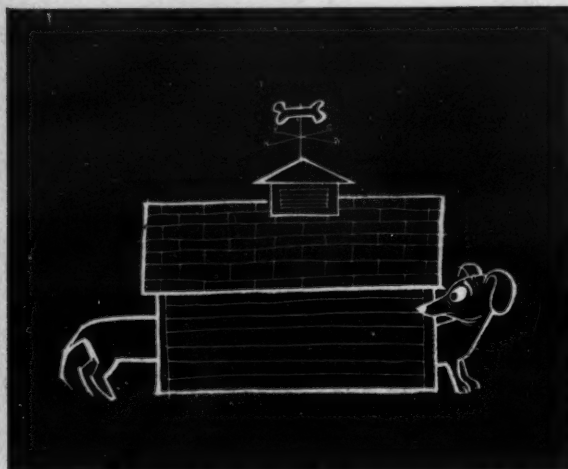
LOUISVILLE DRYERS are fitted to your job for faster, more efficient performance—lower cost in the long run!



INITIAL SURVEY AND ANALYSIS OF YOUR PARTICULAR PROBLEMS



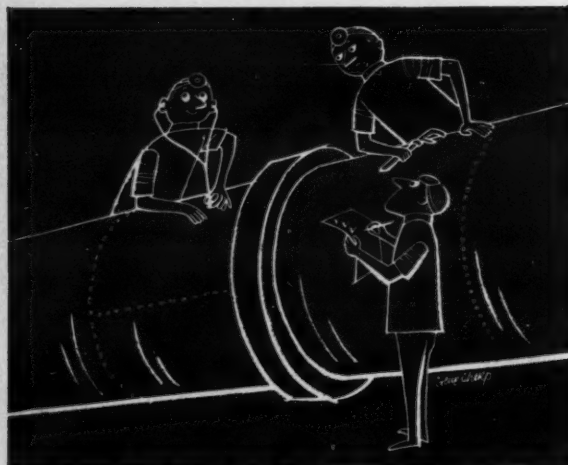
PRE-TESTING IN PILOT-PLANT OPERATION TO ASSURE PERFORMANCE



ACCURATE DESIGN TO MEET YOUR SPECIFIC NEEDS



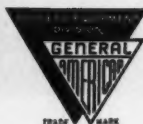
TOP-QUALITY FABRICATION IN GENERAL AMERICAN'S OWN SHOPS



FOLLOW-UP CHECKS AFTER INSTALLATION TO GUARANTEE MECHANICAL PERFECTION AND EFFICIENCY

LOUISVILLE METHOD

1. Initial survey and analysis of your particular problems.
2. Pre-testing in pilot-plant operation to assure performance.
3. Accurate design to meet your specific needs.
4. Top-quality fabrication in General American's own shops.
5. Follow-up checks after installation to guarantee mechanical perfection and efficiency.



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General Offices: 135 So. La Salle St. • Chicago 90, Illinois

NEW SOLUTIONS of processing problems

Southern sugar refineries protect chimney surface with white resin paint . . .

not one failure shown by coatings used for past three years

Problem: Previous coatings on the 190' chimney of Glenwood Co-Operative, Inc., sugar producing plant in Napoleonville, La., were not satisfactory. Excessive moisture, temperature extremes, and exposure to varying weather conditions resulted in several fractures and an extremely porous condition on the chimney surface. As a result, moisture infiltration rusted out underlying reinforcing steel and made it necessary to recondition the chimney.



White coating on chimney at sugar refinery resists heat emitted during burning of sugar cane waste

Chimneys among sugar refineries in Southern Louisiana are not equipped with full internal firebrick linings from top to bottom. Unless adequately protected, chimneys are subjected to rapid structure deterioration in the outer shell from the intense heat emitted through the chimney during the burning of sugar cane waste, known as bagasse.

Solution: After the chimney was reconditioned at Glenwood, one coat of a specially-formulated paint based on Pliolite S-5, a synthetic rubber resin, was applied to the chimney. Black enamel paint was used at top of stack to offset possibilities of discoloration caused by steady stream of smoke. Lettering was retraced with same black enamel used at top. Fifty gallons of white paint based on the resin were used to cover and recondition the chimney.

(Please turn to page 27)

The leading brand
... more for your dollar

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TUBE-TURN

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To help you in the fight on corrosion...

FIBRES of inert iron silicate distributed throughout high-purity iron make wrought iron *tough* and *corrosion-resistant*... hence a desirable piping material for many applications where corrosion is a factor. In this material too, the "TUBE-TURN"* line of welding fittings is *complete*... all types, sizes and schedules for every job in wrought iron piping.

Here is another reason it pays to specify this leading brand! You get exactly what you need from more than 4000 items in all piping materials... available *promptly* from your nearby Tube Turns' Distributor. He can save you purchasing time and delivery time, and give you more for the dollar with TUBE-TURN Welding Fittings and Flanges.

TUBE-TURN Welding Fittings and Flanges are made in U. S. A.
They meet all U. S. piping code specifications.

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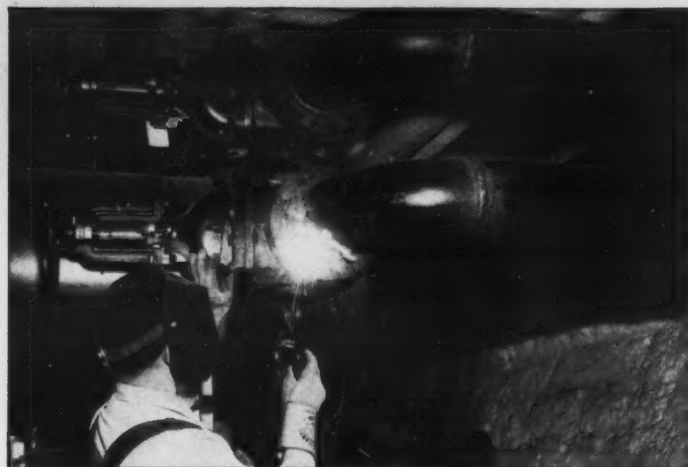
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TUBE-TURNS' Engineering Service

helps you apply wrought iron fittings on jobs like these...



Air Conditioning piping . . . wrought iron and TUBE-TURN® Welding Fittings are used for condenser water lines shown here, part of new air conditioning installation at State Capitol Building, Harrisburg, Pennsylvania. Contractors: Riggs Distler & Co., Inc.



Down Spouts on Abbey Avenue Bridge, Cleveland. Made of 10" wrought iron pipe, with 45° TUBE-TURN Wrought Iron Elbows. Contractor: Gorman-Lavelle Co., Cleveland.



Hospital piping . . . wrought iron 5" cold water, 2½" high-pressure condensate returns and 4" pump discharge . . . at City Hospital, Cleveland. TUBE-TURN Wrought Iron Fittings used throughout.



Radiant Heating. Many engineers prefer wrought iron piping for these systems (and snow-removal systems). Shown here: welding in bank of coils to hot water line with TUBE-TURN Welding Tee at Capitol Annex Building, Frankfort, Kentucky. Contractor: B. A. Waltermann Co., Cincinnati.



All-around Service. Your nearby Tube Turns' distributor will see that your needs in fittings (of all materials, types and sizes) are met promptly. He will also see that you get Tube Turns' engineering service on your piping applications.

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90° ELBOWS



45° ELBOWS



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224 East Broadway, Louisville 1, Kentucky

Please send Bulletin TT-787 on Wrought Iron Fittings.

Company Name _____

Company Address _____

City _____ Zone _____ State _____

Your Name _____

Your Position _____



(Continued from page 26)

Results: Chimney at Glenwood has been in good condition since it was coated with the white paint several months ago. Not one failure has been shown by the coating used on chimneys in a number of sugar refineries in Louisiana during the past three years. Coatings have also been used to recondition chimneys in breweries and some other industries.

(Pliolite S-5 synthetic rubber resin is product of Chemical Div., Goodyear Tire & Rubber Co., Dept. CP, Akron 16, Ohio . . . or for more information check CP 4012 opposite last page.)

Pfizer dries Terramycin economically, efficiently in rotary dryer . . .

product never exceeds 80°F, moisture cut to 3%

Problem: A better way of drying Terramycin was sought by Charles Pfizer & Co. engineers at Groton, Conn. Forced air drying created losses of product and necessitated use of elaborate dust collection systems. Due to constant changes in the pharmaceutical industry, company also had to consider short-range economics of the problem. Savings had to be sufficient to overcome early obsolescence.

Solution: Test results and economic studies indicated that a 5x30' stainless-steel vacuum rotary dryer would do the job. To eliminate necessity of using high temperatures, unit was designed to operate at 28.8 to 29.15" vacuum. Both the dryer shell and agitator shaft are heated to 140°F by circulating hot water.

In operation, unit is charged from the top. Filter cake normally contains 70% moisture and is tumbled at 2 rpm by the heated agitator blades. Material is discharged through bottom of dryer.

Results: Installed in September 1954, engineers found that the dryer could handle one batch every 10 hours — well under the experimental time. Simple dust collecting system is attached, keeping product losses to a minimum. Product contains less than 3% moisture. At no time does temperature of the heat-sensitive material exceed 80°F.

(Buřlovak vacuum rotary dryer was manufactured by Buřlovak Equipment Division, Blaw-Knox Company, Dept. CP, Farmers Bank Building, Pittsburgh, Pa. Check CP 4013 opposite last page.)

For more information on product at left, specify CP 4014 . . . see information request blank opposite last page.



Tube-In-Strip

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Revolutionary NEW Product—

IT'S SOLID!

Offers NEW ECONOMIES

Patents Applied for

Tube-In-Strip comes to you in long coils or in sheets, as you wish. You fabricate it by stamping, bending or otherwise forming it, and then by simple inflation you expand the longitudinal integral internal channels into tubes, round, half-round, rectangular, hexagonal, fluted, as your design calls for. There is your finished product!

Remember, Tube-In-Strip is solid, not a sandwich, not two pieces welded, brazed or bonded together. It is a single piece of flat metal containing inflatable channels that are located and sized to your specifications.

These metals are now available: Copper, Brass, other Copper Alloys, Aluminum. In development: Stainless and Low Carbon Steel.

The web between the tubes conducts heat faster. Structural strength is high, so you can use lighter gauges, saving in weight and price.

Since the initial announcement of this radically new Revere Product intense interest has been displayed by American industry. The Revere Sales Offices, the Technical Advisory Service and the Research and Development Department will be glad to provide additional information, and collaborate with you in taking advantage of this extraordinary new material.

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MORE economical to buy

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MORE strength

MORE efficiency

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Metering

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BEVERAGE INDUSTRIES

ARCHITECTURE AND BUILDING

Structural
Decorative
Functional

MANY, MANY OTHER APPLICATIONS IN EVERY INDUSTRY

When inquiring check CP 4015 opposite last page

NEW SOLUTIONS.

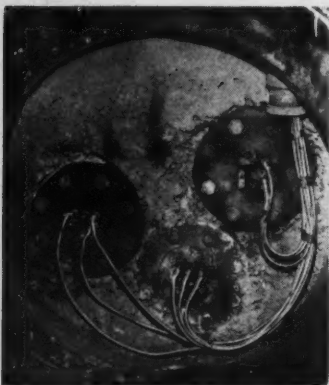
Cuts insulation cost by 94% on boiler lead wires . . .

saves over \$17,000 in one
year and still going strong

Problem: Downtime, labor,
and insulation cost, in replacing
electrically heated heat-transfer
boilers' lead wires, was costing a
large midwestern chemical com-
pany over \$18,000 a year. Am-
bient temperatures ranged over
400°F and ordinary insulation
needed frequent replacement.
Aluminum-alloy wire insulated
with ceramic beads needed to be
replaced every three months.

Insulation cost averaged \$50, labor
for stringing beads and installing
wire about \$500. Time lost while
boilers were idle meant an addi-
tional \$600. Multiplying the four
boilers by four failures a year
gave an annual maintenance cost
of over \$18,000.

Solution: Just over one year
ago the company replaced lead
wires with stranded copper, cov-
ered with Silastic, a specially com-



Lead wire insulation has been in
service over a year, is still in
good shape

pounded silicone-rubber formula-
tion. Total cost of insulation for
four units was \$130, and only
four hours were required to re-
wire each unit, bringing the total
to slightly more than \$500.

Results: Insulation has re-
mained in service since originally
installed, without a failure, and
is still going strong. Savings the



1943



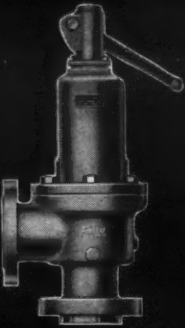
1944



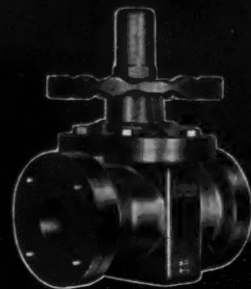
1945



1951



Safety-Relief Valves
Balance Bellows Valves
Farris Engineering Corp.



Pinch Type Flexible
Diaphragm Disc and
SuperSeal Valves
Farris Flexible Valve Corp.



Mechanical and
Hydraulic Governors
Farris Pickering
Governor Co., Inc.

U. S. Patents and Patents Pending

through honest purpose"

The larger and more experienced a manufacturer becomes, the more he appreciates that PROGRESS is not restricted to simply producing fine products at fair prices. Rather, it is the sum total of all the services he renders to his customers day by day and year by year. It is unceasing vigilance to assure customer satisfaction . . . it is constant concern for improvement—for better products at even better prices . . . it is strict adherence to a commercial code of honor, like Farris' policy of "Progress—Through Honest Purpose".

Evidence of this policy's success is seen in the rapid and constant growth of the Farris organization. And even as you read this, more facilities are being added . . . designed to provide even greater service for users of Farris Safety and Relief Valves (which have set the pace in design and performance and have been duplicated by other manufacturers), Farris "SuperSeal" Flex Valves and Farris Pickering Governors.

Behind our continuing growth and the world-wide recognition of Farris as a pacesetter in its field, is the fundamental belief that "honesty of purpose" when dealing with people is always to be trusted. Upon this belief we have grown . . . and, because they believe in the same things, our customers and friends have supported us. Here, beyond doubt, is proof that the right way to grow is THROUGH HONEST PURPOSE.



AFFILIATED COMPANIES

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- Farris Engineering Corp.
- Farris Flexible Valve Corp.
- Farris Pickering Governor Co., Inc.
- Farris Hydrotorque Corp.
- Farris Hydroseal Corp.

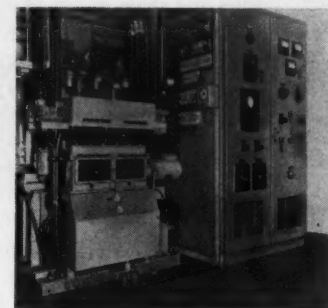
first year have amounted to over \$17,000, a reduction of better than 94%.

(Silastic is product of Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. Check CP 4016 opposite last page.)

Efficiency of 97 per cent obtained with large rectifier . . .

in operation over 32 months, unit is rated at 10,000 amp

Tests on 10,000-amp mechanical rectifier at Pennsylvania Salt Mfg. Company, Wyandotte, Michigan, have established an efficiency of 97% when unit is operating at 85% load. Rectifier has been in operation for more than 32 months.



Rectifier and control panel

Unit supplies direct current to an electrolytic process and is rated for 10,000 amp, at 267v, 60c.

Efficiency was established from readings of AC induction watt-hour meter and DC potentiometer-type watt-hour meter with mechanical integrator. Accuracy of meters has been maintained within one-half of one percent under 85% load at which unit is operating.

(Mechanical rectifier is a product of I-T-E Circuit Breaker Co., Dept. CP, Nineteenth and Hamilton St., Philadelphia 30, Pa. Check CP 4017 opposite last page.)

For more information on product at left, specify CP 4018 . . . see information request blank opposite last page.

highly reactive monomer, intermediate: methyl vinyl ketone

Many of its products
should incite high interest

Physical Properties of Methyl Vinyl Ketone C₄H₆O

Appearance	Colorless liquid
Odor	Powerfully irritating
Boiling point (°C)	
@ 760 mm Hg	81.4
@ 120 mm Hg	32
Refractive index @ 20°C	1.4086
Sp. gr. (20°/4°C)	0.8636
MVK is miscible with water (infinitely), ethanol, methanol, diethyl ether, acetone, and acetic acid	

Uses: Methyl vinyl ketone may be used as a monomer or comonomer in making adhesives, surface coatings, fibers, molding compounds, impregnating compositions, polymeric dye intermediates and anion exchange resins. As an intermediate it will form compounds of interest as bactericides, drugs and specialties.

Features: The molecule of methyl vinyl ketone is multifunctional. It reacts at the vinyl group and at the ketone function, exhibiting reactions typical of an α,β -unsaturated ketone. Very reactive, it can be polymerized in bulk, in the vapor phase, in aqueous media, or in solution.

Despite this extreme reactivity, the compound — when stabilized — can be stored for appreciable lengths of time with no change in its assay or properties, except for a slight change in color. No difficulties in polymerizing the inhibited material have been encountered.

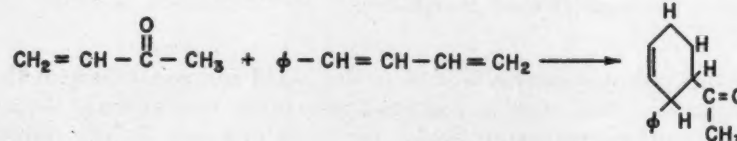
Description: Methyl vinyl ketone has the properties shown in accompanying table. It can be polymerized in bulk by heating with a peroxide catalyst to form tough homopolymers. Their stability, however, is generally limited. Vapor phase polymerization yields water-insoluble polymers; polymerization in aqueous medium gives a latex. Solutions of the polymer can be treated with different compounds to modify its properties.

Much experimental work has been done in the field of copolymerization of the ketone with other monomers. Copolymers of methyl vinyl ketone have been included in studies on the adhesion of polymeric materials to cellulose and aluminum. As with other polymers, flame-resistant styrene-methyl vinyl ketone copolymers were prepared by treating with trivalent phosphorus compounds. Pure MVK is commercially available.

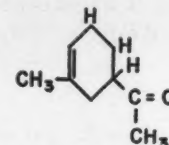
(Methyl vinyl ketone is a product of Chas. Pfizer & Co., Dept. CP, 630 Flushing Avenue, Brooklyn 6, N.Y. . . . or check CP 4019 opposite last page.)

Typical Reactions of Methyl Vinyl Ketone

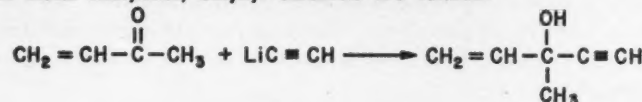
Compound acts as a diene in the Diels-Alder reaction; for example, with 1-phenyl-1, 3-butadiene:



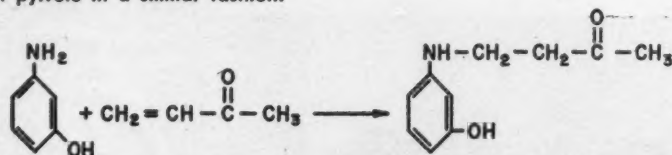
or with itself, forming a dihydropyran:



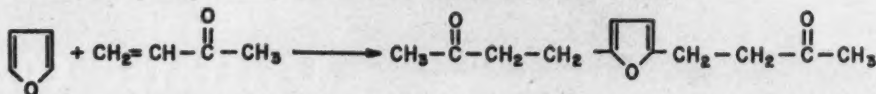
With certain metal acetylides, ethynyl carbinols are formed:



The double bond will undergo addition reactions, forming bis-oxybutyl furans. Methyl vinyl ketone will also react with pyrrole in a similar fashion.



Substituted hydroxy anilines can also be formed as in this reaction:



Here's a one-step way to prepare Teflon so it sticks

Good bonds have been obtained
between treated Teflon and aluminum,
mild steel, wood, and Teflon itself

Because of Teflon's slippery surface and inertness, it is difficult to stick it to itself or to other materials. This problem can now be overcome to a large extent by essentially a one-step surface treatment. Good bond strengths have been obtained between treated Teflon and aluminum, mild steel, wood, and Teflon itself by using conventional commercial adhesives. This process should be of real value in lining and covering tanks, pipe, and ducts, and in facing valves.

Here's how it's done

A thorough cleaning with a solvent (such as acetone) removes grease and other contaminants with might cause poor adhesion. The Teflon is then immersed in a treating bath, made of metallic sodium dissolved in liquid anhydrous ammonia, for one to five seconds. After immersion, the treated Teflon is quickly quenched in cold water to remove any residual agents from the treating step. After standing in air until any metallic luster disappears, the treated plastic can then be cemented to a variety of materials with conventional bonding agents.

Treating bath is prepared by dissolving metallic sodium in liquid anhydrous ammonia. Maximum solution strength is about 1%. Safety precautions are necessary.

Sodium should be completely dissolved before immersion. It is absolutely necessary that moisture be excluded otherwise bonds will be poor. In lab work, a polyethylene film and N₂ have been used as a temporary protection barrier. It is recommended that the height of the container be about 1½ times the diameter to insure complete blanketing. Experimental hand dipping has shown that a bath of 15 grams of sodium in 1500 grams of liquid ammonia will treat about 30 feet of tape 0.010" thick, 8" wide.

Here are examples of actual bond strengths. A 676 psi tensile strength and 114 psi tensile strength in shear have been observed between treated Teflon and aluminum, using Armstrong's A-6 Epoxy Resin with Activator E. The same tensile in shear strength has been measured between treated Teflon samples bonded by the same resin. Using Biggs' bonding agent R-313, tensile in shear strengths of 235-245 psi have been observed between Teflon and oak wood; 315-354 psi between Teflon and mild steel.

(Details of the treatment were supplied by Polychemicals Dept., E. I. du Pont de Nemours & Co. (Inc.), Dept. CP, Wilmington 98, Del. For more information check CP 4020 opp. last page.)

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When inquiring check CP 4021 opposite last page

MATERIALS

Chemical, temperature, physical resistance of fluorocarbon lubes are outstanding . . .

these stable polychlorotrifluoroethylene oils are excellent lubricants

Uses: As lubricants, damping fluids, pump fluids, heat transfer media, release agents, potting and sealing materials. They are designed for critical applications where performance is vital.

Features: These fluorocarbon products resist chemical attack and corrosive conditions, temperature extremes, and emulsion and physical breakdown. They have excellent load bearing characteristics. Under certain conditions, they exhibit the properties of a pure extreme pressure (EP) additive.

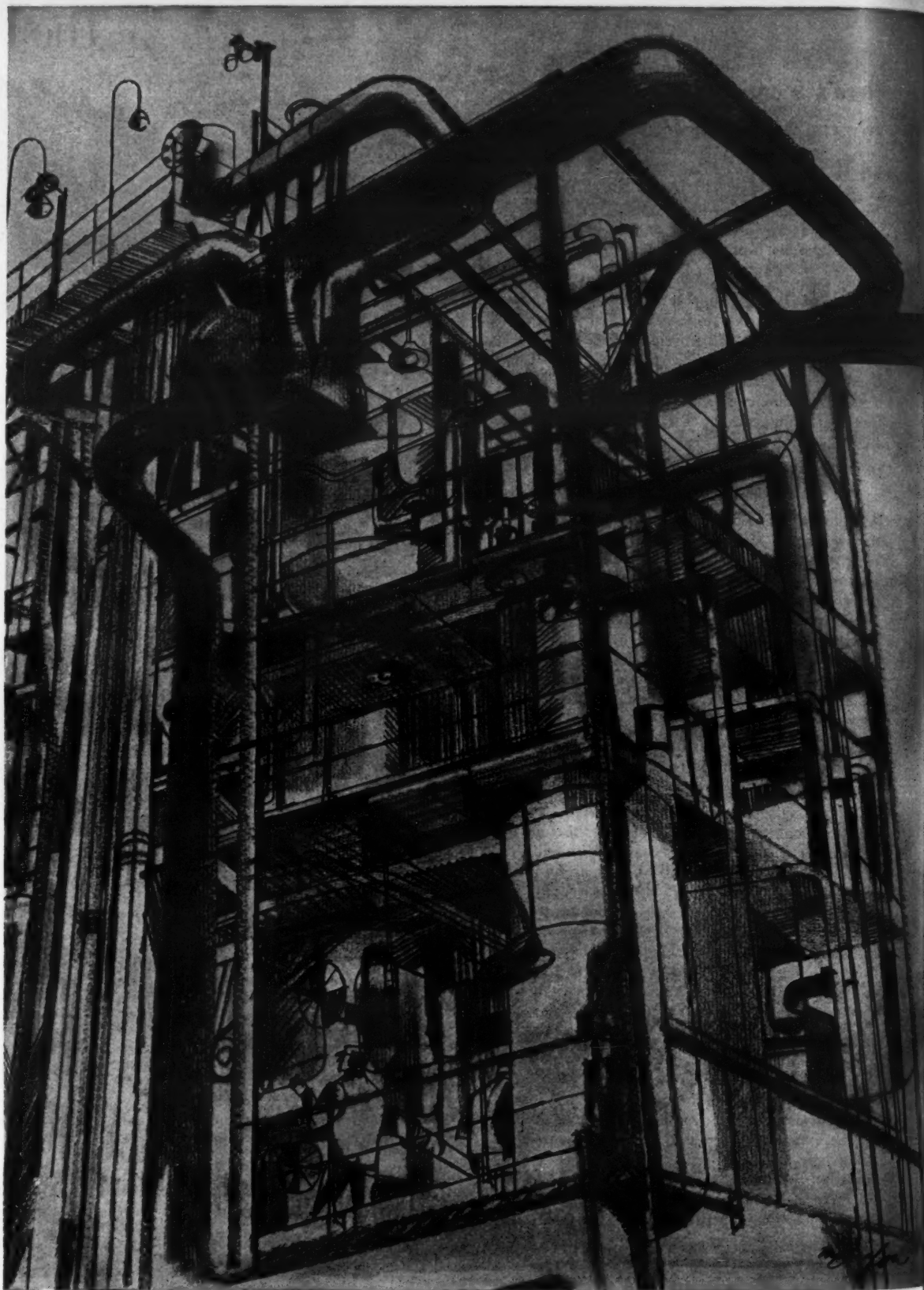
Products are thermally stable up to 500°F, will not carbonize or support combustion, and have low thermal conductivity. Their electrical properties are very good: excellent dielectric strength, and high volume resistivity under thermal cycling and high humidity. They are non-corrosive.

Description: Fluorocarbon oils and waxes are low mw polymers of chlorotrifluoroethylene. The greases are compounded oils and waxes which contain inert thickeners. Specs are given in the table. By mixing these standard grades, intermediate melting points, densities, or viscosities may be obtained.

Grade and description	Viscosity (max-min, cs @ 210°F)	Softening point (max-min, ASTM E-28, °F)	Volatility (max-min, ASTM D-381-50, modified, 310°F, %)	Volatility (19 hr @ 480°F, %)
1 light oil	1.3-0.7	---	100-90	---
3 medium oil	3.5-2.5	---	50-30	---
10 heavy oil	11.0-9.0	---	15-5	---
40 soft wax	44.0-36.0	---	5-0	---
10-200 medium wax	---	160-140	---	80 minimum
200 hard wax	---	210 minimum	---	70 maximum

All are clear and free from insolubles. Hazen color is a maximum of 20 (liquid state), maximum acid value is 0.05 mg KOH/gm, and insulation resistance of the three oils is 1000 megohms, minimum.

(Kel-F oils, waxes, and greases are products of Chemical Manufacturing Div., The M.W. Kellogg Co., Dept. CP., PO Box 469, Jersey City 3, N.J. . . . or for more information check CP 4022 on form opposite last page.)



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— used exclusively by Armour,
now gives you highest
purity fatty acids of
guaranteed composition!

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The consistent composition of Armour Neo-Fats means greater uniformity in your processing. It also means increased standardization of your op-

erating procedures and increased control of production resulting in more uniform quality end products. In shipment after shipment, you'll find Armour Neo-Fats will not vary in specified properties, or composition.

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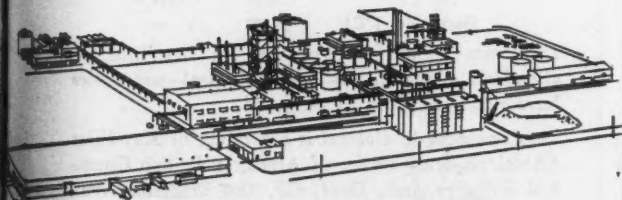
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When inquiring check CP 4023 opposite last page

Alkyd resins made from trimethylolethane have many advantages . . .

light color, gloss retention, hardness, heat stability, fast dry are some of them

Uses: As an intermediate in making alkyds, drying oils, polyesters, isocyanate resins, and plasticizers.

Features: Outstanding advantages of alkyd resins made from product are light initial color, good color and gloss retention, hardness, heat stability, fast dry, alkali and detergent resistance, and good weatherability.

Description: Trimethylolethane is a white, easy pouring powder that melts slightly above 200°C. Its three hydroxy groups are primary, and form stable ester linkages. They do not enter into decomposition reactions frequently encountered with other polyols. Because product is practically non-volatile, its chemical reactions can be easily controlled.

(TME is a product of Heyden Chemical Corp., Dept. CP, 342 Madison Ave., New York 17, N.Y. . . . or for more information check CP 4024 on form opposite last page.)

Non-ionic surface-active agent aids dispersion of water in polyurethane foams . . .

contributes to a thorough, uniform reaction

A non-ionic, surface-active agent, Polyethylene Glycol 600 Mono Oleate, has been found very efficient in aiding water dispersion in polyurethane rigid foams, when used in concentrations of about 0.5%. This gives a very even cellular structure that is formed consistently.

(Non-ionic surface-active agent is a product of Glycol Products Co., Inc., Dept. CP, Empire State Bldg., New York 1, N.Y. . . . or for more information check CP 4025 on form opposite last page.)

Treats hydrated aluminas

Advantages, applications, and general description of hydrated aluminas, prepared from dry process sodium aluminate fired to 1200°C, are described in two-page product data sheet. Typical analysis listing particle size and composition is included.

"Hydrated Aluminas" is available from Reynolds Metals Company, Dept. CP, 2500 S. Third St., Louisville 1, Ky. When inquiring specify CP 4026 on form opposite last page.

If you are concerned with:

Reactor development...

Atomic energy projects...

Nuclear problems...

This new data book will help you

In nuclear science and engineering the importance of the neutron absorption reaction of the boron isotope B^{10} is well recognized.

Now, for the first time, available data on the development of numerous stable, boron-rich materials have been compiled and coordinated by Norton in one convenient reference book.

This book is the "Handbook on Boron Carbide and Elemental Boron" — a compact source of technical information on materials made by Norton for use in the atomic energy field.

A partial list of the table of contents includes: *Boron for neutron absorption . . . Technical grade boron . . . Properties of boron . . . Commercial grades of boron carbide . . . Radiation damage to boron carbide . . . Bonded boron carbide (carbon, silicate, plastic, metal) . . . Boron nitride . . . Metal borides.* These and many other subjects are fully described and illustrated with tables, charts and photographs.

A Quarter-Century of Experience

Work in Norton laboratories on boron compounds began some 25 years ago. This included the development of NORBIDE* boron carbide, the hardest material yet produced commercially. Norton facilities for producing NORBIDE wear-resistant articles and abrasive have been expanded to supply boron carbide in numerous forms for atomic energy applications.

Recent Norton development has been aimed at improving the quality, increasing the production and reducing the costs of various boron-rich products. As

a result, Norton now produces these materials to highest purity standards, at prices ranging between one-half and one-tenth of former pricing.

Other Norton Electric Furnace Products

of special interest to nuclear engineers include ALUNDUM* fused alumina, CRYSTOLON* silicon carbide, MAGNORITE* magnesium oxide, FUSED ZIRCONIA and various refractory carbides, oxides and nitrides.

Besides being the basic ingredients of the famous Norton Refractory R's — refractories engineered and prescribed for the widest range of conventional applications — these high-melting materials are finding many new and valuable uses in atomic energy projects.

This new free Norton "Handbook on Boron Carbide and Elemental Boron", is a valuable reference, containing both fundamental data and practical information. Printed in colors with many charts and tables it will serve as a useful and permanent addition to the reference files of those concerned with atomic energy and related fields.

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When inquiring check CP 4027 opposite last page

MATERIALS

Malonaldehyde diacetal:
chemical intermediate,
cross-linking agent . . .

with urea, forms certain pyrimidine derivatives

Uses: As a chemical intermediate, especially in synthesis of certain pyrimidine derivatives by reaction with urea or its derivatives. It is also a cross-linking and insolubilizing agent for proteins and for polyhydroxy materials. It is of interest as a froth flotation agent.

Features: In presence of aqueous solutions of mineral acids or certain inorganic salts, compound is slowly hydrolyzed to the free aldehyde for synthesis. In this way unnecessary decomposition of the aldehyde is avoided.

Reaction of the chemical with hydroxylamine forms the dioxime. With aniline, it forms the dianil of malonaldehyde which in turn reacts with 3-hydroxy thionaphthene to give a polymethine dye. In addition to undergoing halogenation, compound reacts to form pyrimidine derivatives (already mentioned), pyrazoles, and isoxazole.

With alkyl vinyl ethers, in presence of acid-reacting condensing agents, n-alkoxy aliphatic dialdehyde acetals are formed. With guanidine or substituted guanidine, intermediate forms pyrimidine derivatives.

Description: A malonaldehyde diacetal that is available commercially is 1,1,3-triethoxy-3-monomethoxy propane (TEMP). In addition, experimental and pilot work is currently being conducted on 1,1,3,3-tetramethoxy propane (TMP). Typical properties are:

	TEMP	TMP
BP (°C)	86	66-67
	@ 6 mm	@ 12 mm
Sp gr (25°/4°C)	0.9300	0.9885
Refractive index (n_D^{20})	1.4085	1.4052
Flash point (°C)	>100	—

Due care should be exercised in handling, as chemical, physical, and toxicological properties have not been fully investigated.

(Malonaldehyde diacetal is a product of Kay-Fries Chemicals, Inc., a Div. of American-British Chemical Supplies, Inc., Dept. CP, 180 Madison Ave., New York 16, N. Y. Specify CP 4028.)

Applications for activated charcoal in distilling processes

Ways in which activated charcoal can benefit distilling industry are detailed in three-page technical bulletin.

Bul W-1 is available from Barnebey-Cheney Company, Dept. CP, Cassady at E. 8th Ave., Columbus 19, Ohio. Specify CP 4029 opposite last page.

**Produces variety of hammer effects
when added to conventional
metallic paints . . .**

silicone additive is effective in concentrations as low as 0.1 to 1.0% by wt

Uses: As an additive to produce a variety of hammer finishes from conventional metallic paints.

Features: Effects can range from coarse to fine, depending upon concentration of additive. Effective in concentrations as low as 0.1% to 1.0% by wt, additive adds only about three to five cents per gallon to cost. Shelf life is excellent.

Description: Silicone additive is a solution of silicone polymer in xylene. It is effective in drying-type alkyds, epoxies, soya alkyd-melamine, coconut alkyd-melamine, silicones and modified silicones, and acrylic, nitrocellulose, or ethyl cellulose lacquers. It should be used as supplied.

(F-4290 is a product of Dow Corning Corp., Dept. CP, 592 Saginaw Rd., Midland, Mich. . . or for more information check CP 4030 on form opposite last page.)

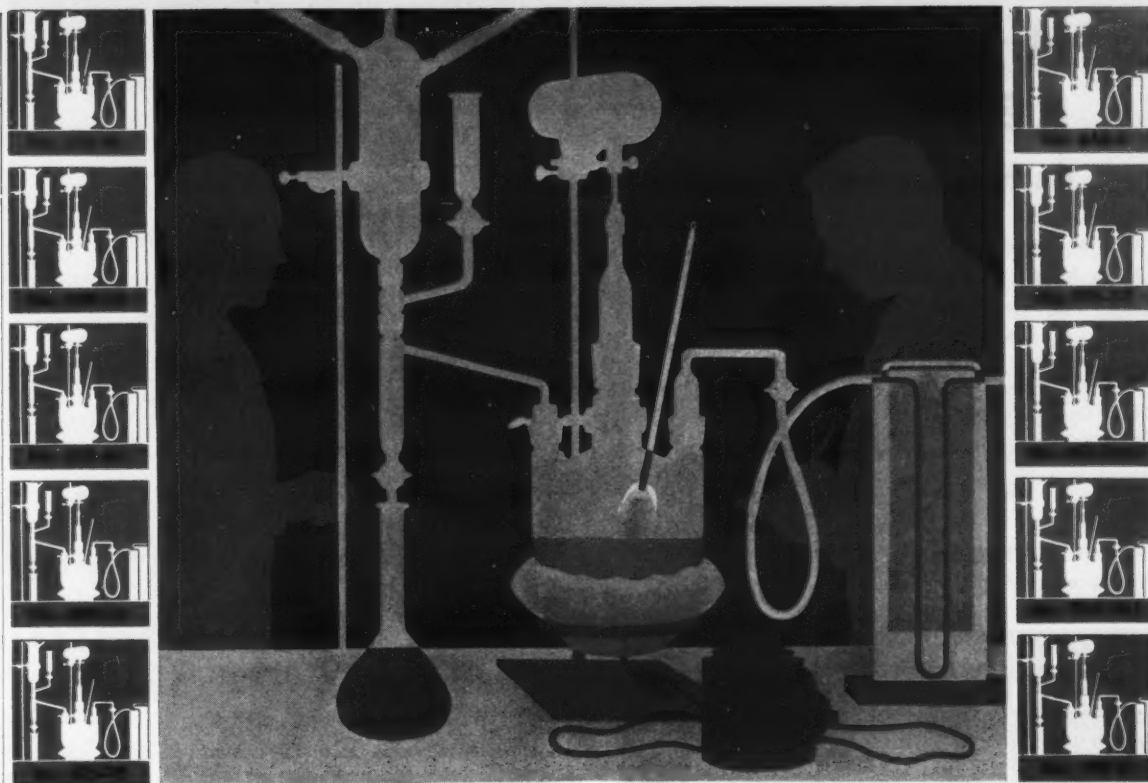
**Colored-tread tire formulas
given in booklet**

Suggested base recipes for tires with colored treads are presented in eight-page bulletin. Formulas include those for synthetic and natural rubber.

Hi-Sil Bul 7 is issued by Columbia-Southern Chemical Corp., Sub. of Pittsburgh Plate Glass Co., Dept. CP, One Gateway Center, Pittsburgh 22, Pa. When inquiring specify CP 4031 on form opposite last page.



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oil alkyds and for poly-
esters used in isocyanate
resins.

When inquiring check CP 4032 opposite last page

HOW WE REFORMED the Neighborhood Nuisance

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A Barnebey-Cheney Automatic Solvent Recovery system of special design not only made the plant a good neighbor by putting an end to the fumes, but recovered enough solvent for re-use to pay for itself in a short time.

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When inquiring check CP 4033 opposite last page

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Barium Carbonate	Potassium Silicate
Calcium Carbonate	Silicon
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Phosphors, (TV tube, CR tube, lamp)	Tungstate Acid Tungstic Acid Tungstic Oxide

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When inquiring check CP 4034 opposite last page

materials

Self-polishing floor waxes must have a high degree of buffability, scuff resistance, anti-slip, and minimum soil pickup. In addition, these waxes should have good initial gloss and freedom from film discoloration. In this quest for better wax formulations, time-honored raw materials have been supplemented — even replaced — by improved products. Here's how two promising newcomers have given an —

improved self-polishing wax base and emulsifier system

A promising addition to the raw materials that the development man can use in formulating a self-polishing wax base is Duroxon J-324. This very hard, emulsifiable wax is made by partial esterification of an oxidized wax, synthesized by the Fischer-Tropsch process from hydrogen and carbon monoxide. This wax offers excellent emulsifiability with very good solvent binding capacity, high hardness, high melting point, low melt viscosity, and a pale yellow color.

Highly efficient emulsifiers for waxes have been found in the amine soaps. Although the type of emulsifier system depends on the required properties of the polish film (such as water resistance and removability), the ratio of emulsifier system to wax base is usually determined by the ingredients incorporated in the wax base, and is constant for such a base. A highly efficient amine which has been recently introduced is 3-methoxypropylamine. 3-Methoxypropylamine (3-MPA) is a derivative of acrylonitrile. It is volatile on drying and imparts a

Comparison of 3-Methoxypropylamine and Morpholine as Emulsifiers For Duroxon J-324 Wax

	A (lb)	B (lb)
Duroxon J-324 wax	100	100
Oleic acid	7 1/2	10
3-Methoxypropylamine	7 1/2	
Morpholine		15
Water	735	725
	850	850

Water is kept boiling. Drop wax melt at about 215-220°F with vigorous agitation. A leveling agent must be added before these can be used as floor finishes.

highly water-resistant film to wax emulsions. It works well with the above wax.

During drying, an emulsion and dispersion do not change greatly in alkalinity because 3-MPA's volatility is about the same as that of water. Compound's odor is inoffensive, and its dispersing action is equal to or better than that of morpholine.

A comparison between 3-MPA and morpholine is made in accompanying formulations. Note that 40% less 3-MPA is needed: This saves about 3c/gal assuming a 70-75c/gal cost for 3-MPA. This emulsion is also more translucent and has a fine gloss. It requires only a leveling agent to give an acceptable floor finish.

(Duroxon J-324 wax is distributed by Dura Commodities Corp., Dept. CP, 20 Vesey St., New York 7, N.Y. Check CP 4035 on form opposite last page.)

(3-Methoxypropylamine is a product of New Product Development Dept. American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N.Y. Check CP 4036 on form opposite last page.)

Properties of Duroxon J-324 Wax

Melting point (capillary tube, °F)	212-218
Solidification point (rotating thermometer, °F)	183-190
Acid value	5-15
Saponification value	30-40
Penetration (100 gm for 5 sec, 77°F)	2-4

Properties of 3-Methoxypropylamine

Melting point (°F approx)	-104
Vapor pressure	
mm Hg	°F
50	120
200	176
760	241
pH of 1% aq soln	11.7
Dissociation constant (K _b @ 24.5°C)	3.2 x 10 ⁻⁴
Sp gr (@ 30°C)	0.8615
Viscosity (cps @ 30°C)	0.782
Refractive index (n _D ²⁵)	1.4153

**Makes vinyl plastisols
hard when cured . . .**

use as copolymerizing material and as an impregnant should be investigated

Uses: As a dispersant for vinyl chloride dispersion-type resins; as a material for copolymerizing with styrene, acrylates, and other monomers; and as an impregnant for leather, paper, and similar materials.

Features: Dispersant polymerizes to a hard resinous material during fusion of resin. It retains no plasticizing action, and makes it possible to formulate vinyl plastics with any degree of hardness by plastisol techniques.

Description: Polymerizable dispersant is a non-volatile, low viscosity, difunctional ester. It polymerizes through the vinyl route, and remains compatible with fused vinyl chloride resin systems containing conventional plasticizers.

(MG-1 is a product of Carbide & Carbon Chemicals Co., a Div. of Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. . . . or for more information check CP 4037 on form opposite last page.)

**Offers deoxynucleosides,
other biochemicals**

Five of ten scarce biochemicals now offered in quantity are deoxynucleosides, particularly interesting for their relationship to deoxyribonucleic acid (DNA). They will assist research into DNA, into mechanisms of growth and heredity, and in study of cancer.

The other five biochemicals are inosine, DL-homocysteine thiolactone•HCl, DL-homocystine, L-cysteine ethyl ester•HCl, and N,N'-dicyclohexylcarbodiimide.

(Biochemicals are products of Schwarz Laboratories, Inc., Dept. CP, Mount Vernon, N.Y. . . . or for more information check CP 4038 on form opposite last page.)

**Polyethylene pipe extrusion
data presented**

Six pages of 16-page booklet are devoted to use of polyethylene in pipe extrusion. Details are given on extruder equipment and operation, die design, extrusion conditions, and cooling and sizing techniques. Remainder of booklet deals with characteristics of polyethylenes for variety of other applications.

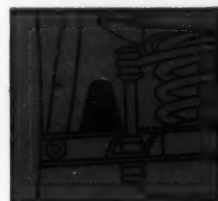
Bul C-5-224 is issued by Chemical Div., Koppers Company, Inc., Dept. CP, Koppers Bldg., Pittsburgh 19, Pa. When inquiring specify CP 4039 on form opposite last page.

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Axle bumper



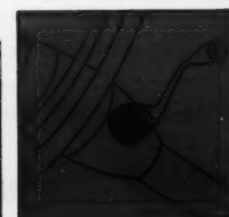
Body seals, gaskets, insulators, pads, grommets, etc.



Brake and accelerator pedal pads, bellows



Radiator and heater hoses, ducts



Gearshift lever cover

Pontiac has been using parts made of Enjay Butyl since 1946. The great '56 model now incorporates more than 100 parts made from this super-durable rubber, adding to its performance, style and value. These parts have amazing resistance to deterioration and will easily last the life of the car.

Among the many advantages of Enjay Butyl are *price* and *ready availability*. And it is now available in non-staining grades for white and light-colored parts. Extensive laboratory and testing facilities are at your service. For the full story, contact the Enjay Company today.



ENJAY COMPANY, INC., 15 West 51st Street, New York 19, N. Y.
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keeping up with

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Sodium handling in the plant

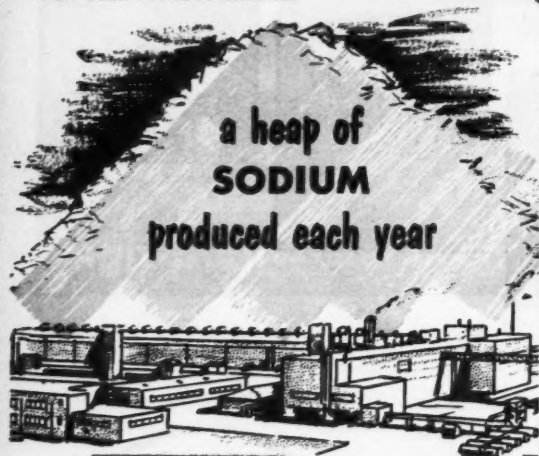
new book describes how

THIS BOOK IS FOR ENGINEERS AND PRODUCTION MEN WORKING IN DESIGN, DEVELOPMENT AND OPERATION OF SODIUM HANDLING EQUIPMENT.

CONTAINS INFORMATION SUCH AS—

- DETAILS OF TYPICAL SODIUM-USING PROCESSES
- DETAILS OF EQUIPMENT INSTALLATION, INSULATION, HEATING, REPAIR
- RECOMMENDATIONS FOR SODIUM PUMPING, METERING, INSTRUMENTATION
- SAFETY IN DESIGN AND OPERATION

FORTY-FOUR PAGES OF DETAILED INFORMATION ON SODIUM HANDLING BASED ON IN-PLANT EXPERIENCE. NO SUBSTITUTE FOR DIRECT U.S.I. TECHNICAL ASSISTANCE, THIS BOOK WILL NEVERTHELESS PROVIDE THE READER WITH A SOLID FOUNDATION IN THE PRINCIPLES AND PRACTICES OF SODIUM ENGINEERING. AVAILABLE FROM U.S.I. WITHOUT CHARGE.



WELL OVER A HUNDRED THOUSAND TONS OF SODIUM ARE USED IN THE UNITED STATES EVERY YEAR. 140 MILLION POUNDS GO INTO TETRAETHYL LEAD; ABOUT 45 MILLION INTO SODIUM CYANIDE; ALMOST AS MUCH INTO FATTY ALCOHOLS; 7 TO 10 MILLION INTO SODIUM PEROXIDE; ABOUT 4 MILLION INTO SODIUM HYDRIDE DESCALING OF STEEL; AND ABOUT 4 MILLION FOR INSECTICIDES, DYES, DRUGS, ALKOXIDE PREPARATION, SPECIALTY CHEMICALS, ATOMIC ENERGY AND A NUMBER OF MISCELLANEOUS USES. AND NOW TITANIUM METAL, "U.S.I. ISOSEBACIC" ACID AND MANY ORGANICS ARE JOINING THE LIST.

U.S.I. TECHNICAL SERVICE HAS BEEN CALLED ON BEFORE OR DURING DESIGN OF ALMOST EVERY NEW SODIUM HANDLING UNIT BUILT DURING THE PAST FEW YEARS. THE SAME SERVICE IS AVAILABLE TO YOU IN ALL PHASES OF YOUR DEVELOPMENT, DESIGN, AND PRODUCTION.



DID YOU KNOW

- THAT MILD STEEL IS SATISFACTORY FOR MOST SODIUM HANDLING EQUIPMENT?
- THAT SODIUM PIPELINES CAN BE CUT AND REWELDED WITHOUT DRAINING?
- THAT SODIUM BRICKS ARE MOLDED IN OPEN AIR?
- THAT MOLTEN SODIUM CAN BE PUMPED AND METERED CONTINUOUSLY?
- THAT THE ATOMIC ENERGY COMMISSION HAS STUDIED OVER 60 CONSTRUCTION MATERIALS FOR SODIUM HANDLING?

RESULTS OF THE A.E.C. STUDIES, ALONG WITH MANY OTHER DETAILS OF SODIUM HANDLING TECHNOLOGY, ARE PRESENTED IN U.S.I.'S NEW BOOK.

ASK FOR NEW U.S.I. SODIUM HANDLING BROCHURE.



INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation
99 Park Avenue, New York 16, N. Y.
Branches in principal cities

MATERIALS

Report of studies on exterior paint made of acrylic resin emulsion

This second progress report gives up-to-date details of lab and commercial studies on exterior paints formulated with Rhoplex AC-33, and acrylic resin emulsions. Typical and suggested outdoor formulations and many test results and pictures are shown in the 42-page report.

"Progress Report #2 on Rhoplex AC-33 for Exterior Paints" is issued by Rohm & Haas Co., Dept. CP, 712 Locust St., Philadelphia 5, Pa. When inquiring check CP 4042 on form opposite last page.

Combination of dispersing, emulsifying properties helps stability . . .

flocculation of solids in aqueous systems is practically eliminated

Uses: As a dispersant for aqueous systems, such as used in emulsion paints, cosmetics, textile and leather products, and rubber emulsions.

Features: In addition to assisting dispersion of resins, pigments, fillers, and other solids, agent has high emulsifying properties. This combination aids production of stable aqueous systems and practically eliminates flocculation of solids.

Description: Agent is a resinous-based water-soluble mixture containing 75% solids. Volatile component is water and alcohol solvents.

(Dispersol is a product of Abco Chemical Co., Dept. CP, 2316 Atlantic Ave., Brooklyn 33, N.Y. . . . or for more information about manufacturer's product, reader may simply check CP 4043 on form opposite last page.)

Bases for making pharmaceutical ointments and emulsions

Forty-page pamphlet deals with a general description of Dehydag compounds (derived from sperm oil) for manufacture of pharmaceutical ointments and emulsions. Origin and constitution, mode of application, and important chemical and physical data are presented. An appendix gives formula suggestions. A bibliography of twelve references is given.

"Biological Bases for Pharmaceuticals" is issued by Fallek Products Co., Inc., Dept. CP, 165 Broadway, New York 6, N.Y. When inquiring check CP 4044 on form which is located opposite last page.

When inquiring check CP 4041 opposite last page

**Increases product purity
and simplifies refining
of fats and oils . . .**

removes proteinaceous bodies,
trace metals present

Uses: Agent is designed to
simplify refining and to increase
purity of fats and oils.

Features: Product advantages
are: 1) More complete removal
of proteinaceous bodies and other
impurities, yielding greater color
and odor stability. 2) Lighter initial
color plus greater susceptibility
to bleaching. 3) Possibility of
partial neutralization without
usual difficulties in soapstock
separation. 4) Removal of trace
metals present as oil-soluble
soaps. 5) Accelerated hydrogenation
followed by better removal
of catalyst traces from product.

Description: Product is a combination of phosphates and high-mw acidic wood products which are known to precipitate protein and similar substances. Two grades are offered: Politol S, a water-soluble product used in primary treatment of crude fat or oil, and Politol N, a water-insoluble grade very effective in finishing operations.

(Fat purification agents are products of Polychemicals Div., West Virginia Pulp and Paper Co., Dept. CP, PO Box 832, Charleston A, S.C. Check CP 4045 opposite last page.)

Paraformaldehyde

Precautions and uses of manufacturer's high purity paraformaldehyde are detailed in eight-page technical bulletin.

"Paraformaldehyde" is issued by Heyden Chemical Corp., Dept. CP, 342 Madison Ave., New York 17, N.Y. Specify CP 4046 opposite last page.

For more information on product at right, specify CP 4047 . . . see information request blank opposite last page. ➡

NOW IN OPERATION—GAF'S NEW PLANT FOR HIGH PRESSURE ACETYLENE DERIVATIVES

the story behind the headline




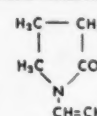
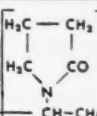
For those of you who have not been eating, sleeping and breathing high pressure acetylene reactions as we have, a brief reminder on the background of these products may be in order. In the early 1930's, Dr. J. Walter Reppe, working in Germany, licked the previously "impossible" problem of handling acetylene efficiently and safely at high temperatures and high pressures in chemical syntheses. This led him and his group into varied investigations which resulted in the synthesis of numerous chemicals which had previously been completely unknown, or at best only obtainable by elaborate and expensive reactions.

Even though widespread work in this field has continued steadily up to the present, and the laboratories of General Aniline in this country have been engaged in their own independent research for more than ten years, vast and challenging areas of research still remain for exploration in the new branch of chemistry involving high pressure acetylene reactions.

When the GAF laboratories began synthetic work in the new field, none of the products they turned out had ever been available in the U.S. in commercial volumes and at commercial prices. We, therefore, found it necessary to do some rather fancy, long-range extrapolating from the physical and chemical properties of all of the products to their potential applications and sales volumes in order to decide which would be of greatest immediate industrial value. Following these decisions came sales development, application research, and process development in the laboratory and pilot plant. Finally, the plant stage has been reached for the first group of products now to be made at GAF's new Calvert City plant.

They are a related series resulting from the reaction of acetylene with formaldehyde to yield a mixture of butynediol and propargyl alcohol. In a relatively brief time they have developed an astonishing and, we must confess, in part unexpected range of applications about which GAF's Commercial

PRODUCTS TO BE AVAILABLE FROM GAF'S NEW PLANT AT CALVERT CITY, KENTUCKY:

PROPARGYL ALCOHOL	$\text{HC}\equiv\text{CCH}_2\text{OH}$	2-BUTYNE- 1,4-DIOL	$\text{HOCH}_2\text{C}\equiv\text{CCH}_2\text{OH}$
1,4- BUTANEDIOL	$\text{HOCH}_2\text{CH}_2\text{CH}_2\text{CH}_2\text{OH}$	BUTYRO- LAETONE	
2-PYRROLIDONE		N-METHYL-2- PYRROLIDONE	
N-VINYL-2- PYRROLIDONE		POLYVINYL- PYRROLIDONE (PVP)	

Development Department has told you in advertisements, data bulletins and personal visits. Along with the large new plant now also comes a new, full-scale sales department eager to help you use these products to your best advantage.

We expect to be reporting the commercialization of many more high pressure acetylene derivatives in the future, but no announcement will have quite the significance of this first one, both for you and for us. We believe it represents a milestone for our industry: the first of many commercial high pressure acetylene derivatives plants in the United States.

For technical
information,
price schedules
and samples
write to:

ANTARA

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ACETYLENE CHEMICALS DEPARTMENT
ANTARA CHEMICALS

A SALES DIVISION OF
GENERAL ANILINE & FILM CORPORATION
435 HUDSON STREET • NEW YORK 14, NEW YORK

From Research to Reality

If you process Rubber...



Important new technical data now available!

It might pay you to evaluate this versatile material in your plant right away. This may lead to better processing methods or entirely new products.



A-C POLYETHYLENE is available in pellet form. For technical data and samples, write us on your letterhead today.

Commercially accepted...

A-C POLYETHYLENE can help you! This low molecular weight polymer is now commercially accepted for a number of processing jobs. And it is currently being examined as a modifier for all types of natural and synthetic rubber.



A-C* Polyethylene

COMMERCIALY ACCEPTED!

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ALLIED CHEMICAL & DYE CORPORATION

Room 558

40 RECTOR STREET, NEW YORK 6, N. Y.

New York • Chicago • Cleveland

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When inquiring check CP 4048 opposite last page

MATERIALS

Polyacrylamide can be used alone or as intermediate

Use in adhesives, surface coatings, and as thickener, protective colloid seen

Uses: In adhesives, low-water-loss cements, leather impregnants, paper coatings, molded articles, surface coatings, and as a thickener. Polymer has been recommended as a smoothing agent for silk, as a dispersant, and as a protective colloid. Its role in soil conditioning has been established.

Features: The potentialities that this stable, neutral polymer exhibits are its drawing card. It gives adhesives a high initial tack, excellent spreadability, and water resistance. As a coating on plaster or paper, it acts as a release agent for easy stripping of adhesive materials.

Compound increases efficiency of wax or rosin paper sizes. In conjunction with gelatin, it is a good protective colloid. It can be applied to soils as a conditioner and as a synergist for certain fertilizers.

Surface coatings made from the polymer are effectively used on metal or rubber. Its thickening action may be put to good use in latex paints, cosmetics, and printing pastes. A solution with five mol % carboxylic acid salt groups makes a good substitute for gum arabic, British gum, starch, dextrine, and other thickeners in certain applications.

Description: Three grades of polyacrylamide are available on a small scale. PAM's 50, 75, and 100 are white odorless amorphous powders with molecular weights from about 40,000 to 2,000,000.

Readily soluble in cold water, they are slightly soluble in many organics. In fact, their maximum concentration in water depends upon solution viscosity, not solubility. This is illustrated in the chart.

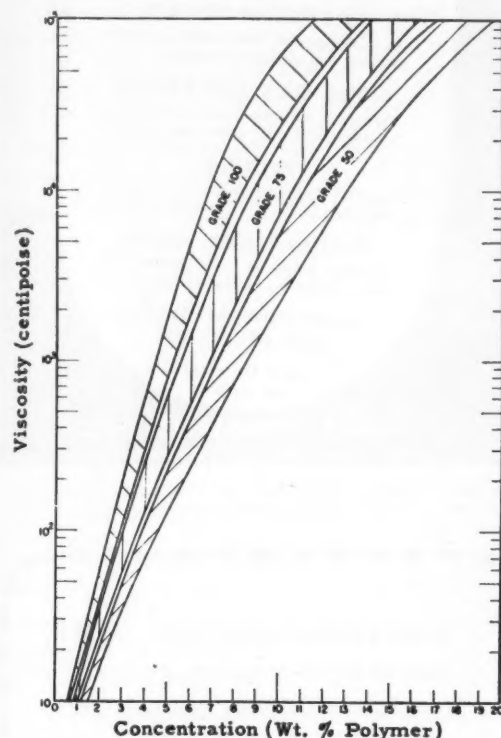
Chemically, its most important reaction is methylation. To do this, treat a 10% aqueous solution of PAM 50 with 37% formalin. A basic catalyst such as a 20% Na_2CO_3 solution is added until pH 10 is reached. After holding 2-3 hr at 50°C, batch is cooled to 30°C. For storage stability, pH is adjusted to 7. Resins made from N-methylolated polyacrylamide are suitable for binding agents for brake bodies, clutch discs, and grinding discs. They may also find application in molded articles and in paint and lacquer formulations.

Heating with an aqueous alkali for about two hours at 90°C hydrolyzes polyacrylamide. This product will give grouting cement mixtures a low water loss.

Conversion of some of the amide groups to imides

can be effected by treatment with acids having dissociation constants greater than 1×10^{-3} . Conversion may be either within or between molecules. Intramolecular imidization does not change linear nature of the polymer, but does decrease its solubility. Intermolecular imidization gives cross-linking and reduces polymer's water solubility.

Chlorination — in presence of light, metals, or



Effect of concentration on Brookfield viscosity for aqueous polyacrylamide solutions at 25°C

metallic salts — raises hardness and softening point and reduces flammability.

Alkaline hypohalites convert some amide groups to amine groups, giving polymers that are cationic in nature if hydrolysis reactions are kept to a minimum.

(Polyacrylamides are products of New Product Development Dept., American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N. Y. . . . or for more information check CP 4049 on form opposite last page.)

Find vapor pressure of ethanol-water solutions — fast. See the nomograph on page 204

BRIEFS

for buyers of

Benzoic Acid
Sodium Benzoate
Muriatic Acid
Inert Lubricants

No SNEEZE in this benzoic acid

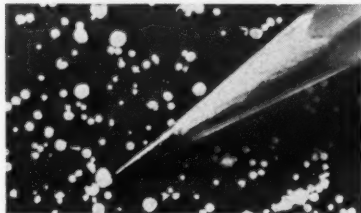
PROBLEM: You may sometimes get complaints that the powdered benzoic acid you're buying makes production men sneeze.

Not hazardous, certainly. But bothersome. Could even become a morale problem.

ANSWER: A bead form of benzoic acid, technical, which we developed to answer this very complaint. The tiny beads keep their shape during handling, but dissolve readily into process.

RESULT: No dust. No sneezing. Better operations.

Try a 25-lb. drum of Hooker bead-



form the next time you order benzoic acid. See if it doesn't make a difference.

You can also get powdered benzoic acid from us, in technical and U.S.P. grades. Both forms are delivered in 25, 50, and 100-lb. drums. For technical data, check the coupon. For samples of either form, write us on your business letterhead.

Dust-free sodium benzoate, too Sneezing is less a problem with sodium benzoate than with benzoic acid. But if you use our sodium benzoate, it's no problem at all. We've perfected a flake form that's as nearly dustless as sodium benzoate can be. A special, tightly-controlled flaking operation does it.

You can get the resulting firm, clean flakes in technical or U.S.P. grade.

We supply powdered sodium benzoate in both grades, too. Either form comes in 25, 50, or 100-lb. fiber drums. For technical data, check the coupon.

Fluorolubes®—Special inertness

Sometimes you buy a chemical for what it won't do.

EXCELLENT EXAMPLE: Fluorolubes, which are polymers of trifluorovinyl chloride.

A select number of industries buy these for lubricants because of the won'ts we put into them. Fluorolubes won't break down in the presence of oxygen, hydrogen peroxide, concentrated nitric acid, or other reactive chemicals. They won't be injured by heat up to 300°C., won't burn, won't poison.

Fluorolubes will wet metallic surfaces readily and thoroughly. The makers of ultra-precision instruments find them particularly valuable. For example, incredibly sensitive gyroscopes depend on Fluorolubes to float the gyro unit without friction or reaction of any kind.

In industries handling highly reactive materials, Fluorolubes are proving their mettle as pump, valve, and bearing lubricants, and as pipe thread sealing compounds. Since they are non-toxic, Fluorolubes are ideal anti-friction compounds for oxygen equipment in medical as well as other fields.

Their densities are unusually high for organic compounds—1.88 gm/cc for the lighter Fluorolube oils to 2.0 gm/cc for the heavy greases.

Presently Fluorolubes are higher priced than ordinary lubricants. In many cases, they more than justify their price by reducing maintenance and corrosion. In a few applications, no other lubricant will work, so Fluorolubes are cheap at any price.

If you think you have potential applications for Fluorolube oils or greases, we'll be glad to confer with you and provide sample quantities. Please write on your business letterhead. For a complete data file on the Fluorolubes, simply check the coupon.

A whale of a problem! That's what iron, sulfates, and other impurities in muriatic acid can be to your production men.

Let even small amounts of these materials sneak into your production, and products that should be white may come out yellow; equipment may gum up with insoluble precipitates; yields may be reduced considerably.

Enter Hooker White Grade muriatic acid with these sterling credentials: iron content, .0001% at most; sulfates, .003%; free chlorine, none; arsenic, none; organic matter, only .0002%. Probably the purest muriatic acid you can buy anywhere in volume.

For requirements only slightly less stiff, we recommend Hooker Commercial Grade muriatic: iron, .0005%; free chlorine, a trace; sulfates, .003%; organic matter, .001%; arsenic, none.

If muriatic acid is a problem in your processing, you can probably improve matters with one of these exceptionally pure grades. Either is available in 13-gallon carboys and in rubber-lined tank cars, in three strengths: 18°, 20°, 22° Baumé.

For further technical data, simply clip the coupon. Write us on your business letterhead for samples.

For technical data on Hooker chemicals discussed on this page, check here:

- ☐ Sodium Benzoate
- ☐ Benzoic Acid (beads)
- ☐ Benzoic Acid (powdered)
- ☐ Fluorolubes
- ☐ Fluorolube Greases
- ☐ Fluorolube, Safe Lubricant for Oxygen Equipment
- ☐ Muriatic Acid

How up-to-date is your technical data file on these other Hooker chemicals? Check the products you'd like information on:

- ☐ Antimony Trichloride, anhydrous
- ☐ Benzotrichloride
- ☐ Benzoyl Chloride
- ☐ Benzyl Chloride
- ☐ Benzyl Thiocyanate
- ☐ Butyryl Chloride
- ☐ Caprylyl Chloride

Clip and mail to us with your name, title, company address.

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When inquiring check CP 4050 opposite last page

PROOF

of versatility of EMPOL® 1022 Polymerized Fatty Acid



More than 80 Use-Patents Already Issued to U.S. Companies!

More and more companies are finding that Empol 1022 offers wide possibilities for exploitation in new products...exclusive products. More than 80 use-patents held by these companies are dramatic proof of the versatility and new-product potential of this unique raw-material.

This liquid, high molecular weight (C_{36}), dibasic acid still offers unlimited opportunities for the development of new, exciting end-products. Its dibasic structure, high molecular weight (C_{36}), excellent heat-stability, and high viscosity make it ideal for polyesters, esters, polyamides, soaps and other derivatives in such applications as adhesives, coatings, petroleum products, surfactants, resins and rubbers.

Why not investigate Empol 1022 and see how it can lead to profit-making end-products for you? Mail coupon below for literature or write for evaluation samples.



Fatty Acids & Derivatives
Plastolein Plasticizers
Twitchell Oils, Emulsifiers

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Carew Tower, Cincinnati 2, Ohio

Please send complete information on Empol
1022 Polymerized Fatty Acid.

Name.....Title.....

Company.....

Address.....

City.....State.....

When inquiring check CP 4051 opposite last page

MATERIALS

**Less blush tendency,
better physicals
from cure agent...**

epoxy resin paints can be
cured at room temperature

Uses: As a cure agent for paints made from manufacturer's Epon epoxy resins, especially under adverse weather conditions.

Features: Paints can be cured at room temperature and exhibit film properties of chemical and physical resistance ordinarily achieved only in baked surface coatings.

Other advantages over conventional aliphatic polyamine curing agents are:

- 1—Less tendency to form "curing-agent blush" on films cured at high humidity
- 2—Faster rate of cure, particularly around 35 to 40°F
- 3—Better initial color and color retention
- 4—Better adhesion and less embrittlement on aging
- 5—More resistant to water, caustic, and solvents
- 6—Mild odor
- 7—Easier to handle

Description: The curing agent is a liquid of 40-44% solids (by wt) and a viscosity (Gardner-Holdt) of S-V. Weight per gallon is 8.11 lb. Available in experimental amounts, recommended addition in formulations is about 50 parts (by wt) for each 100 parts of resin solids in base vehicle.

Storage of cure agent in metal cans has produced no viscosity increase in one year. Agent does not corrode the containers. After cure agent has been added, "pot life" is about 18 to 60 hr, depending upon solvent blend and concentration. Standard cure is about 20 min at 300°F; at room temperature, from one to seven days.

(Experimental Epon curing agent C-111 is a product of Shell Chemical Corp., Dept. CP, 50 W. 50th St., New York 20, N.Y. . . . or for more information check CP 4052 on form which is located opposite last page.)

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SILICA

Amorphous, Crystalline and Diatomaceous in various grades for paints, fillers and enamels.

MAGNESIUM SILICATE

A finely ground, very white extender pigment and suspension medium.

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The purest, smoothest and whitest clays produced. Ideal for pastes and cements.

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Imported and domestic grades for paints and fillers and also for the pottery trades.

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A special grade for paint grinders' use as a suspension and flattening agent.

**ALSO MINERAL BLACK
AND RED OXIDE**

Send for prices
and samples.

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When inquiring check CP 4053 opposite last page

An odor problem to contend with? . . . Let our Industrial Odorant Division solve it for you . . . Let our years of pioneering "know-how" come to your aid in eliminating or improving any objectionable plant or product by-odor that may be bothering you. We can assist you effectively and economically — and without obligation — if you will write us fully concerning your difficulties.

FRITZSCHE
Brothers, Inc.

PORT AUTHORITY BUILDING, 76 NINTH AVENUE, NEW YORK 11, N. Y.

BRANCH OFFICES and *STOCKS: Atlanta, Ga., Boston, Mass., *Chicago, Ill., *Los Angeles, Calif., Philadelphia, Pa., San Francisco, Calif., Montreal and *Toronto, Canada and *Mexico, D. F. FACTORY: Clifton, N.J.

When inquiring check CP 4054 opposite last page

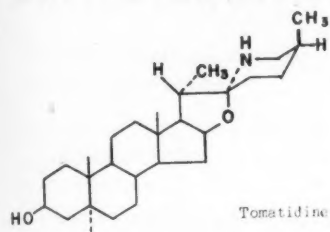
CHEMICAL PROCESSING

MATERIALS

Tomato stems and leaves seen as potential steroid and alkaloid source

A crystalline glycosidal alkaloid isolated from leaves and stems of certain species of tomatoes may become of commercial importance. Called tomatidine, it is composed of an aglycone portion, tomatidine (see formula), and a tetrasaccharide moiety consisting of two molecules of glucose and one each of xylose and galactose.

Experimental results suggest possible commercial applications for the alkaloid and its derivatives



as antifungal agents in treatment of mycotic skin diseases, precursors for sex and other hormones.

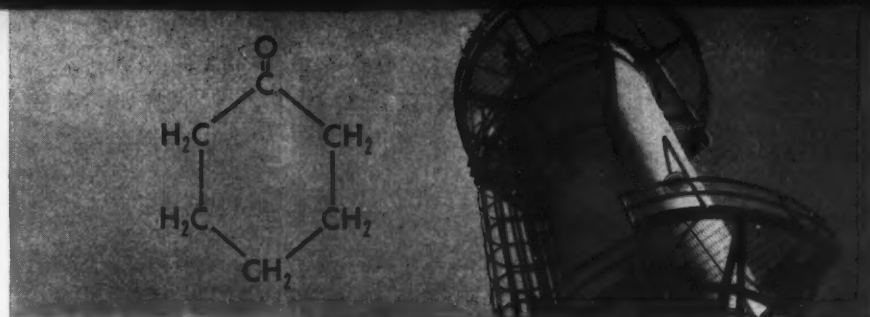
(Information from Agricultural Research Service, USDA, Washington 25, D.C.)

Photoelectricity, photochemistry

Catalog of technical reports available on photochemistry and photoelectricity have been made available. The documents listed are primarily reports of research done under Government sponsorship, but some are technical papers captured by the Allies in Germany in World War II.

To obtain catalog CTR-311 remit 10c direct to Office of Technical Services, US Dept. of Commerce, Washington 25, D.C.

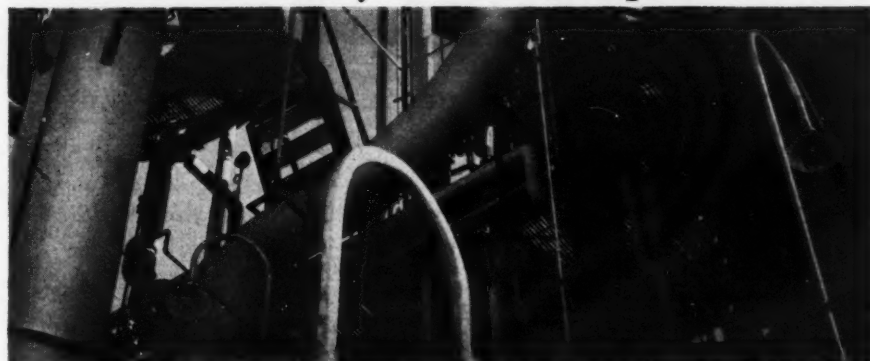
For more information on product at right, specify CP 4057
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a new source — a new name for cyclohexanone



available now from basic production



New plant, new product, new high standard of quality . . . that's the quick story of National NADONE. Users everywhere tell us that it makes exceptionally light-colored resins of very high quality.

If you now use or may use cyclohexanone as a solvent or reactive intermediate, we would

like you to receive a working sample of NADONE so that you can find out for yourself how fine it really is.

We'll also be glad to send you our 24-page Bulletin I-19, now being printed, giving properties, reactions and a very inclusive bibliography. Use the handy coupon below.

NATIONAL ANILINE DIVISION ALLIED CHEMICAL & DYE CORPORATION 40 RECTOR STREET, NEW YORK 6, N. Y.

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Please send copy of Technical Bulletin I-19

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POSITION _____

COMPANY _____

ADDRESS _____

LAB

REPORT

A plus feature for plastic and rubber baby products

Problem: Impart a pleasing odor to baby specialties that will make them more acceptable to mothers.

Requirements: Must withstand curing temperature, be a pleasant, consumer-acceptable odor, and not discolor.

Solution: Resodor 16, at a concentration of from 1/4 to 1/2%, imparts a "baby talc type" odor which is always acceptable and popular because of its sweet, clean odor characteristics. Resodor 16 is added directly to the rubber or plastic material before curing or milling. It is heat-stable and does not affect color.

SINDAR Corporation
Industrial Aromatics and Chemicals

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MATERIALS

Long life and abrasion-resistance features of glass-Dacron yarn which adheres to copper . . .

will withstand abuse encountered in processes of motor and generator manufacture

Uses: Wrapping magnet wire and electrical cable or as sleeving and tubing for electrical components.

Features: Yarn has long life and abrasion-resistant qualities which enable it to withstand considerable abuse encountered in processes of manufacturing motors, generators, and transformers.

Description: Material adheres readily to copper. It is composed of glass and Dacron which give it good electrical insulation properties. Yarn can be supplied wound on serving or braider packages.

(Glass-Dacron yarn is a product of L.O.F. Glass Fibers Co., Dept. CP, 1810 Madison Ave., Toledo 1, Ohio. . . or for more information check CP 4060 on form opposite last page.)

Efficient heat and light stabilizers for PVC resins and copolymers give films of high clarity

Cd-Ba stabilizers are very easily dispersed

Uses: As a liquid stabilizer for calender, solution, and dispersion-type polyvinyl chloride resins and copolymers.

Features: Stabilizers are very easily dispersed. They are compatible with vinyl chloride polymers and copolymers, primary and secondary plasticizers, and inorganic and organic pigments. Very efficient, they stabilize against heat and light, producing films and sheetings of a high degree of clarity.

Description: Stabilizers are compounded of cadmium and barium organic salts with a chelating agent. They have these specs:

	Stabelan 110	Stabelan 115
Sp gr	1.006 ±0.002	1.015 ±0.002
Ash content (%)	12.5 ±0.1	12.7 ±0.1

Both are light brown liquids which do not color. They can be mixed in at any stage without preblending or premixing.

(Stabelans are products of Stabelan Chemical Co., Dept. CP, 837 Buckingham, Toledo, Ohio, and are distributed by Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio . . . or for more information check CP 4061 on form opposite last page.)

LOOK
INTO
THE

Nitroparaffins

— a whole new family of chemical building blocks for new products. The Nitroparaffins and derivatives are already at work in more-than-a dozen industries, including CHEMICAL MANUFACTURING, TEXTILE and APPAREL, RUBBER PRODUCTS, PETROLEUM, PAINTS and LACQUER, PLASTICS and RESINS.

NITROMETHANE
 CH_3NO_2

NITROETHANE
 $\text{CH}_3\text{CH}_2\text{NO}_2$

1-NITROPROPANE
 $\text{CH}_3\text{CH}_2\text{CH}_2\text{NO}_2$

2-NITROPROPANE
 $\text{CH}_3\text{CHNO}_2\text{CH}_3$

Learn how the NP's may be of help in improving your present product or in creating new products.

write:

COMMERCIAL SOLVENTS Corp.

260 MADISON AVE.

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Branches in principal cities

When inquiring check CP 4062 opposite last page

CHEMICAL PROCESSING

**Offers over 400 monomers
for research, production**

More than 400 chemicals, especially developed for use in industrial research laboratories in the field of polymerization, are listed in eight-page catalog. Included also are catalysts and accelerators and cross-linking agents for preparation of specialty polymers. Although most of these monomers are made in research quantities, commercial quantities could be produced if there is sufficient interest.

Monomer-polymer price list is issued by Monomer-Polymer Div., Chemical Div., The Borden Co., Dept. CP, 511 Lancaster St., Leominster, Mass. When inquiring check CP 4063 on form opposite last page.

**Used as chemical reagent:
lithium borohydride**

Uses: In determination of free carboxyls in peptides and proteins as after esterification and acetylation, only ester groups and not peptide groups are reduced. It is useful in the field of sterols and in reduction of compounds containing ketonic, aldehyde, or ester carbonyls and a nitrile group, where reduction of the carbonyl but not of the nitrile group is desired.

Features: Reactivity and solubility is about midway between the reactive ether-soluble lithium ammonium hydride and the relatively unreactive water-soluble sodium borohydride. Aldehydes and ketones are reduced quickly and esters slowly. Amides and acids are generally not reduced; oximes are reduced to primary amines; nitro compounds are reduced with great difficulty.

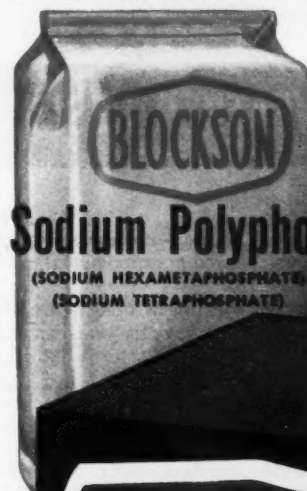
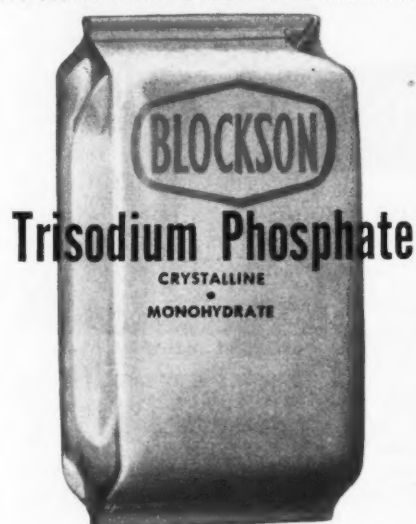
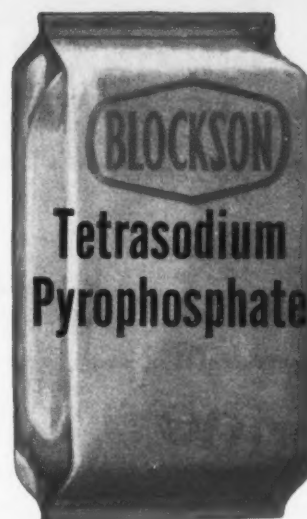
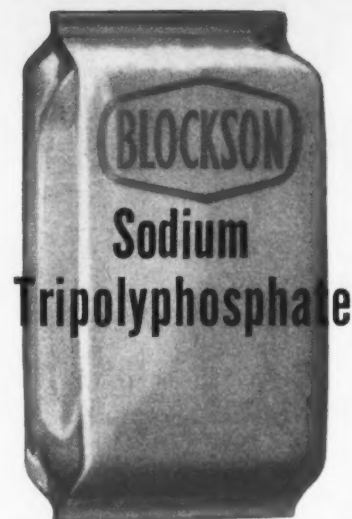
Description: Lithium borohydride, LiBH_4 , is a white, crystalline, hygroscopic solid that melts at 279°C .

(Lithium borohydride is a product of Aldrich Chemical Co., Inc., Dept. CP, 3747 N. Booth St., Milwaukee 12, Wis. . . . or for more information check CP 4064 opposite last page.)

**Growth of LP-gas industry
and product uses told**

Layman's description of liquefied petroleum gas industry and its growth is given in eight-page booklet. Non-technical explanation of the history, characteristics, production, transportation and use of LP-gas is presented with illustrations.

"LP-Gas, The Cinderella Fuel" is available from Gulf Oil Corp., Dept. CP, Pittsburgh, Pa. When inquiring specify CP 4065 opposite last page.



Sodium Polyphos is Blockson's brand name for a water soluble Glassy Sodium Phosphate with the desirable characteristics of Sodium Hexametaphosphate and Sodium Tetraphosphate.

ALSO MAJOR PRODUCERS OF:

SODIUM ACID PYROPHOSPHATE

TRISODIUM PHOSPHATE CHLORINATED

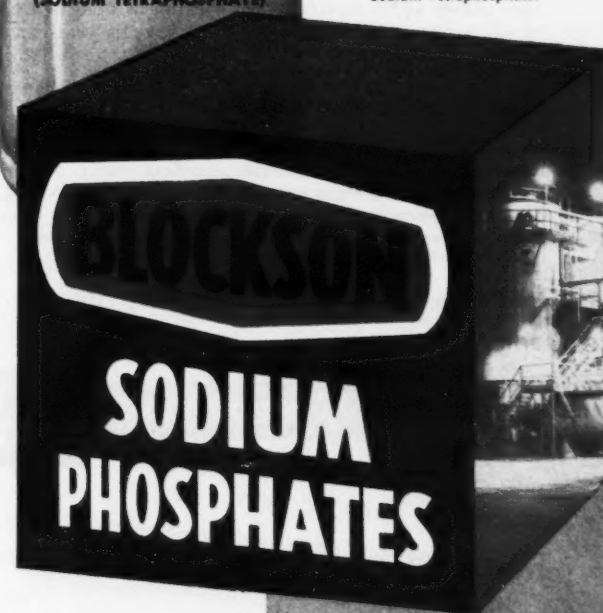
DISODIUM PHOSPHATE
ANHYDROUS • CRYSTALLINE

MONOSODIUM PHOSPHATE
ANHYDROUS • MONOHYDRATE

SODIUM FLUORIDE

SODIUM SILICOFLUORIDE

HYGRADE FERTILIZER



BLOCKSON CHEMICAL COMPANY

Division of Olin Mathieson
Chemical Corporation
Joliet, Illinois

When inquiring check CP 4066 opposite last page

ADVANTAGES FOR ALKYDS... WITH
Glycerine

NEW WEATHER RESISTANCE

A new type of weather-resistant alkyd resin—made from isophthalic acid and *Glycerine*—is now being offered in experimental quantities.

The stability and compatibility of *Glycerine* as a polyol in surface-coating alkyds and its low MW/Hydroxyl ratio, have for years made a wide range of resin properties feasible.

Now *Glycerine* is combined with isophthalic, a dibasic acid which only recently became available in commercial quantities and which imparts higher viscosity with lower acid number. It also permits higher fatty acid content at workable consistencies. The result: excellent outdoor durability, mildew-resistance and gloss-retention—all demonstrated in a five-year exposure test completed recently. Among 100 alkyd-based enamels tested, an isophthalic-soybean-*Glycerine* alkyd enamel stood up best.

Here again, nothing takes the place of *Glycerine*.

This balanced group of properties keeps

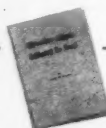
Glycerine's

usefulness growing

HYGROSCOPICITY • STABILITY •
 SOLVENT POWER • VISCOSITY • NONVOLATILITY •
 NONTOXICITY • TASTE • MW/HYDROXYL RATIO •

HUMECTANT •
 CARRIER • SOLVENT • LUBRICANT • SOFTENER •
 EMOLLIENT • ANTI-FREEZE • ALKYD BASE •

☒ CHECK AND SEND FOR TECHNICAL DATA



☐ 20-page booklet
 "Glycerine Alkyds
 Tailored to Need"



☐ 8-page booklet on
 "Federal Specifi-
 cations for Glycerine"



☐ 16-page booklet on
 Glycerine properties
 and applications

For your free copy of any or all of these booklets write: GLYCERINE PRODUCERS' ASSOCIATION • 295 Madison Ave., New York 17, N.Y.

When inquiring check CP 4067 opposite last page

MATERIALS

Give suggested paint formulations based on PVA emulsion

Series of four data sheets present suggested formulations for primer-sealer paint, interior paint, brick red exterior masonry paint, and green exterior masonry paint based on Elvacet 81-900 polyvinyl acetate emulsion. Preparation procedures and paint properties are given.

Data sheets 55-1 to 55-4 are issued by Electrochemicals Department, E.I. duPont deNemours & Co. (Inc), Dept. CP, Wilmington 98, Del. When inquiring specify CP 4068 on form opposite last page.

Synthetic textiles can be treated with anti-static finish that lasts through washing, dry cleaning . . .

finish is easy to apply by padding, spraying

Uses: As a durable anti-static treatment for synthetic textiles.

Features: Finish is durable to both repeated launderings and repeated dry cleanings. It is easy to apply to Dynel, Orlon, Acrilan, and similar fibers, and yet is difficult to remove. No catalyst or high-temp curing is necessary. It is compatible with many resins, water repellents, stiffening agents, and softeners.

Description: Finish is a complex vinyl-type compound and appears as a viscous, white to light amber liquid. It is shipped as an aqueous solution. For use, it is diluted with water and applied to fabric by padding or spraying, and then thoroughly dried. It can also be applied during dry cleaning.

(Niatex AG-2 is a product of Textile Fibers Dept., Carbide and Carbon Chemicals Co., a Div. of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. . . . or for more information check CP 4069 on form opposite last page.)

Details care and handling of vat dyeing pastes

Collection of facts valuable to personnel handling vat dyeing and printing pastes is presented in 10-page booklet. General precautions, some "do's" and "don't's", and storage, handling, and sampling details are covered.

"Care and Handling of Vat Dyeing and Printing Pastes" is available from Dyestuff Dept., American Cyanamid Co., Dept. CP, Bound Brook, N.J. When inquiring specify CP 4070 on form opposite last page.

**Two modified Fischer-Tropsch waxes
synthesized from CO and H₂
have unusual properties . . .**

both waxes are very hard, produce films of high gloss

Hard wax for liquid solvent-type formulations, Duroxon E-321 is a modified hydrocarbon wax made from hydrogen and carbon monoxide by the Fischer-Tropsch process. Big use is seen in making solvent-type liquid polishes. With this wax, polishes of high solids content will stay liquid at very low temperatures and will show practically no separation in tropical temperatures. Suspensions can be prepared with as high as 20% solids and can be sprayed easily to give films of outstanding gloss and hardness. Films dry without "chalking."

Typical properties are:

Solidification point (rotating thermometer, °F)	83-86
Acid value	5-15
Saponification value	30-45
Penetration (100 gm, 5 sec, 77°F)	2-4
Color	yellow

Hard emulsifiable wax especially suited for non-ionic emulsions, Duroxon H-111 is also a derivative from the Fischer-Tropsch process. Outstanding property is that it is able to produce transparent emulsions with non-ionic emulsifiers. Emulsions are compatible with resin and polymer additives. The basic wax emulsion has outstanding gloss, hardness, and buffability. By blending basic wax emulsion with resin or polymer dispersions, anti-slip, buffability, film hardness, and other characteristics can be controlled.

Non-ionic wax emulsions are of special interest to shoe polish and leather industry. Paste-forming characteristics of Duroxon H-111 are excellent. In anionic emulsions, wax "bodies" the product. Properties of this wax are shown in the table.

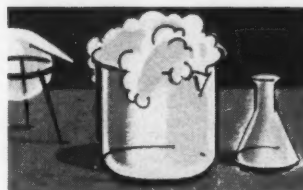
Solidification point (rotating thermometer, °F)	181-188
Acid value	10-20
Saponification value	40-60
Penetration (110 gm, 5 sec, 77°F)	2-4
Color	yellow

(Duroxon waxes are distributed by Dura Commodities Corp., Dept. CP, 20 Vesey St., New York 7, N.Y. Check CP 4071 opposite last page.)

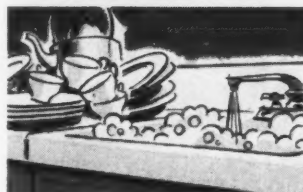
**General-purpose casting resin
subject of data sheet**

Curing instructions and properties of general-purpose epoxy casting resin are subject of technical bulletin 7-2-10 issued by Emerson & Cuming, Inc., Dept. CP, 869 Washington St., Canton, Mass. Specify CP 4072 opposite last page.

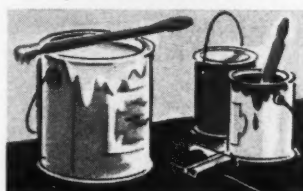
THESE SUNOCO PETROCHEMICALS CAN HELP YOU GET HIGH-QUALITY END PRODUCTS



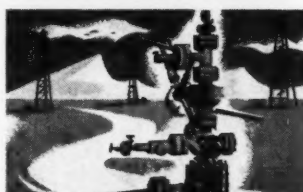
POLYURETHANE FOAMS



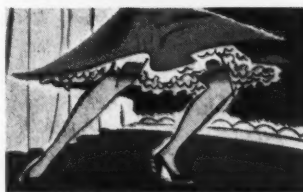
DETERGENTS



PAINT, VARNISH, LACQUER



CORROSION INHIBITORS



SYNTHETIC FABRICS

BENZENE

Thiophene-free benzene means less expensive processing. Sunoco Benzene is guaranteed Nitration Grade with a minimum freezing point of 5.2 C and a high mol % purity.

TOLUENE

Mol % purity of 99.9 assures greater yields. Sunoco Toluene is paraffin- and thiophene-free.

XYLENE

Lower than usual acid-wash color gives higher product quality.

PROPYLENE TRIMER

Consistent uniformity eliminates color problems in end products. Low sulfur. Narrow distillation range.

SUNAPTIC ACIDS

High molecular weight, low unsaponifiables and no olefinic unsaturation allow possible substitution for fatty, naphthenic and synthetic acids. Very efficient in corrosion inhibitors.

PDO-40 (Petroleum Drying Oil)

Excellent film-forming ability of this high-grade petroleum resin makes it highly resistant to water, alkalis and dilute acids.

SULFONATE WS

Low in cost, this water-soluble sulfonate has a wide variety of uses as a wetting agent, re-wetting agent, air entrainer and frother.

SULFUR

New from Sun!! This bright molten sulfur is currently available only in bulk in areas near Marcus Hook, Pa.

ANHYDROUS AMMONIA

New from Sun!! Refrigeration and commercial grades available in tank cars only from Sun's refinery in Marcus Hook, Pa.

For complete information see your Sun Representative. Or write for free technical bulletins to Sun Oil Company, Philadelphia 3, Pa. Dept. CP-3.



INDUSTRIAL PRODUCTS DEPARTMENT

SUN OIL COMPANY

PHILADELPHIA 3, PA.

IN CANADA: SUN OIL COMPANY, LTD., TORONTO AND MONTREAL

When inquiring check CP 4073 opposite last page

THE SWITCH IS TO... DAVISON SILICA GEL FOR DRYING NATURAL GAS

Actual use tests have proven to many that Davison Silica Gel is the efficient, economical way to dry natural gas.

Davison Silica Gel gives you a high capacity for moisture even at elevated temperatures (110-120°F.). It is economical to use because it requires fewer reactivations and gives longer life due to its resistance to fouling and attrition. Davison Silica Gel dries a wide variety of gas feeds to extremely low dew points. It is one of the most efficient adsorbents known for hydrocarbon recovery.

Investigate Davison Silica Gel for drying natural gas. Your Davison Field Service Engineer will be glad to give you all the details or write for complete technical data on drying of natural gas contained in Davison Bulletin No. 201.

Progress Through Chemistry

DAVISON CHEMICAL COMPANY

Division of W. R. Grace & Co.
Baltimore 3, Maryland

Sales Offices: Baltimore, Md. • Chicago, Ill. • Columbus, Ohio • Houston, Texas • New York, N. Y.
Producers of: Catalysts, Inorganic Acids, Superphosphates, Triple Superphosphates, Phosphate Rock, Silica Gels and Silicofluorides. Sole producers of DAVCO® Granulated Fertilizers.



MATERIALS

para-Coumarone indene resins covered in bulletin

p-Coumarone indene resins, important to the formulator of rubber plastics, adhesives, or coatings, are the subject of a six-page data bulletin. Use in rubber compounding, compatible materials, a descriptive listing of the various resins, a softener study of the resins in GR-S compounds, and description of other applications than in the rubber industry are covered. Trade named Piccoumaron, the resins are products of Pennsylvania Industrial Chemical Corp., Dept. CP, Clairton, Pa., and are distributed by the firm below.

Bul #12-64-5-12-55 is issued by Harwick Standard Chemical Co., Dept. CP, 60 S. Seiberling St., Akron 5, Ohio. When inquiring specify CP 4075 on form opposite last page.

Cuts and colors aluminum in finishing operation . . .

compounds counteract aluminum's tendency to drag under buffing

Uses: For cutting and coloring aluminum in finishing operations.

Features: Compounds counteract aluminum's tendency to drag under buffing. They provide excellent cut and leave surface with a high clean color.

Description: Liquid Tripoli 303 and 420 are effective in heavy duty cutting applications. Liquid Tripoli 728 is used in appliance and automotive fields. Where high color is a requisite, bar stocks No. 6B-168, 6B-72, and 8390 are recommended. These latter are aluminum oxide compounds.

(Aluminum buffing compounds are products of Hanson-Van Winkle-Munning Co., Dept. CP, Church St., Matawan, N.J. . . . or for more information check CP 4076 on form which is located opposite last page.)

Properties of gear lubricant listed in revised bulletin

Lithium-base lubricant's properties are detailed in revised two-page bulletin. Chart compares compound with standard open-gear lubricants in jaw load *vs* frictional torque tests. Physical specifications are included.

Bul 105 is available from The Alpha Molykote Corp., Dept. CP, Stamford, Conn. When inquiring specify CP 4077 on form which is located opposite last page.

When inquiring check CP 4074 opposite last page

**Isophthalic acid in glycerine alkyds
gives superior resin properties
at higher oil lengths . . .**

high degree of polymerization at oil lengths as high as 67 percent

Isophthalic acid in straight glycerine resins gives a very high degree of polymerization at oil lengths as high as 67%. This means that alkyd and paint manufacturers can get the advantages of glycerine in alkyds of medium and long oil length. Glycerine forms longer resin molecules than can be obtained with polyols of higher functionality. These long molecules build hard, tough coatings and provide lasting protection under severe service conditions. Experimental work was concentrated on glycerine alkyds in the oil length range of 50 to 63%, made with mixtures of isophthalic acid and phthalic anhydride. Optimum ratios were found that gave well polymerized resins with minimum amounts of isophthalic acid and glycerine. These resins approach gelation slowly when cooked, are stable in storage, yet are highly reactive in forming strong and durable coatings. This ratio of isomers varies with oil length and is not linear.

When compared with conventional alkyds, the mixed isomer alkyds showed better color, good gloss, good through drying, and a higher degree of hardness with undiminished abrasion resistance and flexure and impact strength for comparable oil lengths.

(From a report by C.S. Miner, Jr. and John D. Hind, Miner Laboratories, 9 S. Clinton, Chicago, Ill., in January 1956 issue of *Official Digest*, published by Federation of Paint and Varnish Production Clubs, 121 S. Broad St., Philadelphia 7, Pa.)

(Information furnished by Glycerine Producers' Association, Dept. CP, 295 Madison Ave., New York 17, N.Y. Check CP 4078 opposite last page.)

**Progress of fermentation chemistry,
biochemical engineering depicted**

Progress of fermentation chemistry and biochemical engineering is covered, in non-technical language, in 32-page book illustrated in color with photographs, drawings, and diagrams. Book details two parallel lines of investigation that provide short cuts in microbial manufacture of valuable chemicals. Simple flow charts are used to illustrate operations in biochemical engineering. Progress from primitive stages to now when selected mold organisms are controlled for production of antibiotics, hormones, vitamins, and many valuable industrial and agricultural chemicals is outlined.

"Our Smallest Servants" is available on letterhead request from Chas. Pfizer & Co., Inc., Dept. CP, 630 Flushing Ave., Brooklyn 6, N.Y.

EXON: each resin engineered for a specific problem



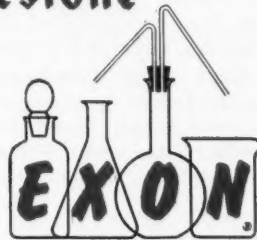
EXON solution resins

varying in properties to suit specific needs



Your needs are the blueprints of Firestone engineers. There are several distinctly different Exon solution resins to solve industry's varied problems regarding application, purpose, performance conditions and surfaces. The significance is this: if you require a solution resin specifically engineered to fit your particular set of problems, you're likely to find it in the growing line of Firestone Exon resins. For example:

Firestone



For complete details on these and all other Firestone Exon resins, write:

CHEMICAL SALES DIVISION

FIRESTONE PLASTICS COMPANY, POTTSTOWN, PA., DEPT. 68E
DIVISION OF THE FIRESTONE TIRE & RUBBER CO.

EXON 450 Good solubility, film tensile strength and durability allow formulations to be based on this one resin alone. Coatings can be spray-applied, and strip off cleanly and easily.

EXON 461 Fluorinated, non-flammable, thermoplastic. Soluble in aromatic, ketone and ester type solvents. Films adhere to porous substrates, show excellent heat and light stability, exceptionally low vapor transmission, good resistance to inorganic chemicals including concentrated acids and alkalis.

EXON 470 Excellent adhesion to metals, alkyd and vinyl surfaces. Compatible with various drying oils, alkyds, phenolics and melamines. Highly soluble in ketone solvents. Good aromatic tolerance.

EXON 471 has excellent solubility. Unmatched as a protective coating. Corrosion resistant, adheres to vinyl, paper and cloth. Will adhere to wash primer. Common lacquer techniques can be used in application of coatings. Numerous solvent systems are possible, permitting use in a wide variety of applications.

When inquiring check CP 4079 opposite last page



These two experts can help solve your methyl chloride and methylating problems

Our Messrs. Neuville and Zellner (left to right above) cover all the bases when it comes to methyl chloride application and the special field of methylation. They come by their particular specialties honestly. Since 1936 Ansul has been a constant and expanding source of supply for bulk methyl chloride in the domestic and export markets. In the field of methylation alone (Morrie Neuville's specialty) Ansul has successfully methylated more than 100 compounds.

The methylation laboratory at Ansul is equipped to take over a methylating problem of yours at any stage of development. Manufacturing facilities for producing

commercial quantities of a methylated compound to your specification are also available.

As a major producer of methyl chloride, Ansul is prepared to supply you with quantities ranging from laboratory containers to cylinders of 100 pounds, 140 pounds, and 1,300 pounds. Tank cars of 40,000 pounds and 78,000 pounds are available. Delivery is prompt.

For general information about methyl chloride and its bulk application, write to Bob Zellner. Questions or just conversation relating to methylation should be addressed to Morrie Neuville. THE ANSUL CHEMICAL COMPANY, DEPT. C-32, MARINETTE, WISCONSIN.



When inquiring check CP 4080 opposite last page

MATERIALS

Lubrication, anti-wear properties of organo-silicone compounds can be put to use . . .

products retain release, thermal characteristics of silicone oils

Uses: In special lubricants, as release agents for rubber and plastics, in cosmetics, and as emulsifying agents or emulsion breakers.

Features: Organo-silicone compounds have lubrication and anti-wear properties that compare to those of petroleum oils. Of the six compounds produced, four are water soluble and two are easily soluble in aromatic solvents. They retain release and thermal properties of silicone oils.

Description: Organo-silicone polymers are described as follows: A moderate viscosity fluid, soluble in water is designated X-520. Same compound with 0.5% by weight of phenyl *alpha*-naphthylamine (PANA) added, to minimize oxidation and supply maximum hydrolytic stability, is X-525. Soft, low melting point waxes, also soluble in water are X-521, and with PANA added they are labeled X-526. Low viscosity fluids, soluble in both high and low aromatic solvents but insoluble in water, are designated X-522 uninhibited, and X-527 when PANA is added. Where temperatures above 350°F are encountered for prolonged periods, more PANA may be added to improve stability.

Fluid	SAE Wear Test* (15 hr)	
	Viscosity (cstks @ 100°F)	Weight Loss (mg of steel rings)
X-520	600	115
X-522	74	83
Petroleum Oil	107	Fails within 1 hr

*Conditions of test:

Main shaft speed (rpm)	470
Load (scale, lb)	135
Rubbing ratio	3.4:1
Oil addition (cc/hr)	33
Temperatures (°F, in 15 min test cycle)	200-250

When stored in original shipping containers compounds have a shelf life of over six months. Presence of water or excessive heat will decrease this time. Water solutions exhibit same corrosiveness as water.

(Organo-silicone compounds are a product of Linde Air Products Company, Div. of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N. Y. Check CP 4081 opposite last page.)

Chemical, physical properties included in price list

Average physical properties for company's line of dryers, fungicides, and specialty chemical items are included in pocket-size product price list issued by Nuodex Products Co., Inc., sub. of Heyden Chemical Corp., Dept. CP, Elizabeth F, N.J. Specify CP 4082 opposite last page.

**Show promise for use
in plastics and
finishes . . .**

pyromellitic acid and the dianhydride come in developmental quantities

Compounds show much promise for many uses in the plastics and finishes fields. Pyromellitic acid (1,2,4,5-benzenetetracarboxylic acid) improves film properties in alkyd resin formulations.

The dianhydride (PMDA) forms unusual polyamides, polyamines, and polyesters. Epoxy resins cured with PMDA have good physical and electrical properties, high chemical resistance, and heat distortion temperatures above 250°C. PMDA also hardens epoxies in coating and laminating applications. Both are available in development quantities.

(PMA and PMDA are products of Explosives Dept., E.I. du Pont de Nemours & Co., (Inc.), Dept. CP, Wilmington 98, Del. . . or for more information check CP 4083 on form opposite last page.)

**Highly reactive intermediate:
methyl acetoacetate . . .**

this compound offers interesting advantages

Uses: As an intermediate in making acetoacetylides, phenyl methyl pyrazolone, and in other organic syntheses. It is also a solvent.

Features: This methyl ester has more activity per pound than the ethyl ester. It also reacts faster and at lower temperatures. There also are no Federal regulations governing its use.

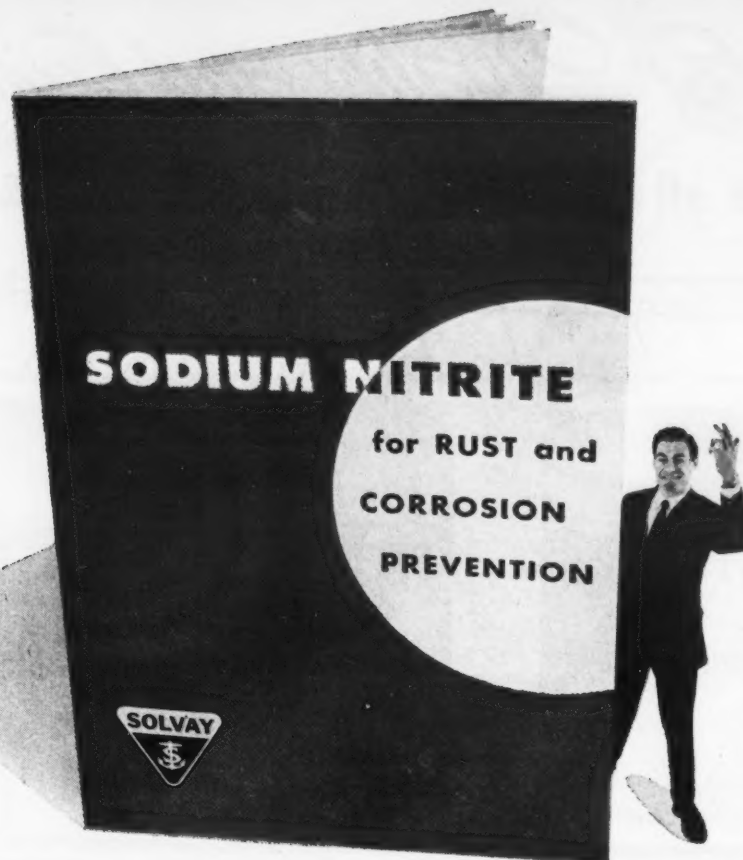
Description: Methyl acetoacetate has formula $\text{CH}_3\text{COCH}_2\text{COOCH}_3$.

(Methyl acetoacetate is distributed by Aceto Chemical Co., Inc., Dept. CP, 40-40 Lawrence St., Flushing 54, N.Y. . . or for more information check CP 4084 on form opposite last page.)

**Suggestions for making stain-
and blister-resistant paint**

Prepared to give the formulator some suggestions for developing stain- and blister-resistant paints, 13-page brochure gives four suggested formulations, information for preparing painting surfaces, and details for building an ADM blister box.

"Stain- and Blister-Resistant Paint Portfolio" is issued by Archer-Daniels-Midland Co., Dept. CP, 700 Investors Building, Minneapolis 2, Minn. When inquiring check CP 4085 on form opposite last page.



**Come in and see what
SOLVAY SODIUM NITRITE
can do!**

The new edition of this book may prove extremely helpful to anyone interested in the prevention of rust and corrosion.

This new book describes how SOLVAY Sodium Nitrite is being used, alone and in combination with other materials, for the cleaning, neutralizing and protection of metal in such diverse applications as: cargo holds of ocean-going tankers in light petroleum service; steel scouring pads; machined parts in process; steel forms such as sheets, pipes and wire; metal tanks and containers; and circulating water systems.



Available without cost. Simply fill in and mail the coupon.



SOLVAY PROCESS DIVISION
ALLIED CHEMICAL & DYE CORPORATION
61 Broadway, New York 6, N. Y.

Gentlemen: Please send me without cost or obligation*

- ☐ Your new book "SODIUM NITRITE for Rust and Corrosion Prevention"
- ☐ Sample of SOLVAY Sodium Nitrite

Name _____

Company _____

Title _____

Address _____

City _____ Zone _____ State _____

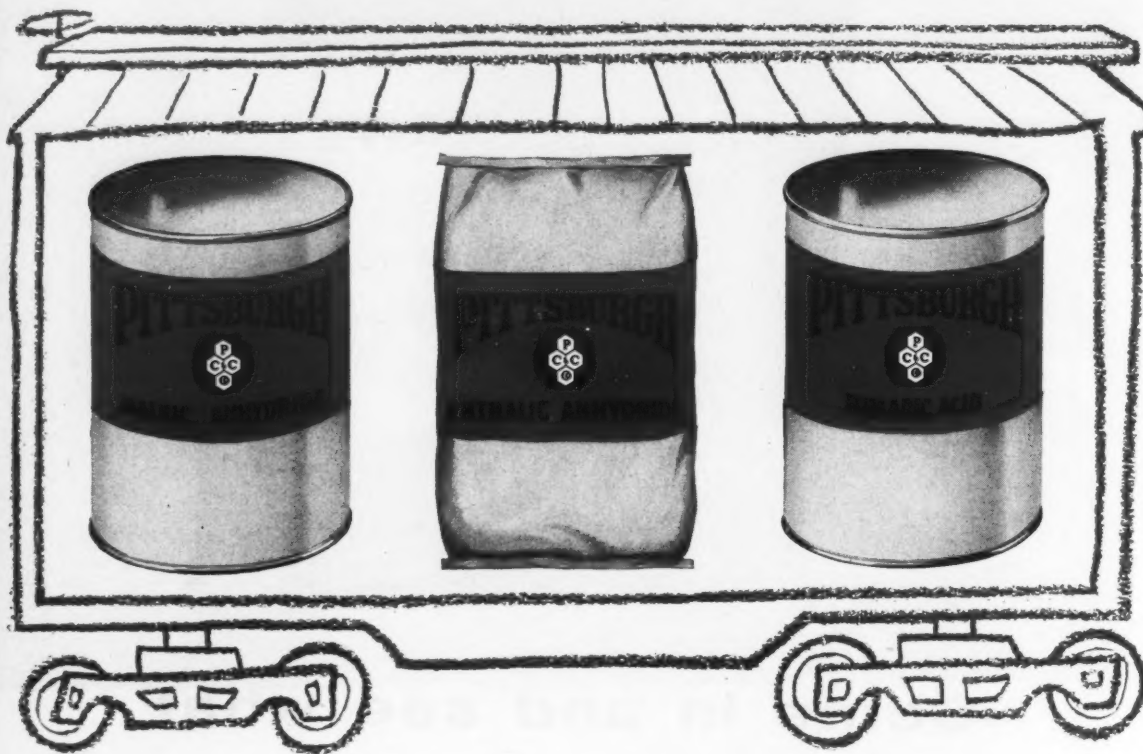
*In Western Hemisphere Countries

DS-3

When inquiring check CP 4086 opposite last page

For Quality and Economy

Order all three from Pittsburgh Coke & Chemical!



It makes *good* sense to order your phthalic, maleic and fumaric from one source—Pittsburgh Coke & Chemical. For example, a single order with Pittsburgh simplifies your paper work. And if any follow-up is necessary, it's easier to deal with one supplier than three.

By ordering split carload lots, you'll enjoy favorable carload prices on *all* of the materials you order. You can split the cars in any proportion you like.

Products of Pittsburgh's Industrial Chemicals Division

Plasticizers	Alpha Picoline
Benzene	Beta Gamma Picoline
Toluene	Phenol
Xylene	Ortho Cresol
Phthalic Anhydride	Meta Para Cresol
Maleic Anhydride	Ammonium Sulfate
Pyridine	Sulfuric Acid
	Fumaric Acid

Smaller orders of lower volume items allow better inventory control at your plant.

Best of all, you enjoy the confidence of doing business with a *basic* producer when you order from Pittsburgh. That means assurance of uniform product quality, continuity of supply, regardless of market conditions, and alert, responsive sales and technical service. • Write today for specification sheets on any of the Pittsburgh industrial chemicals below.



COAL CHEMICALS • PROTECTIVE COATINGS • PLASTICIZERS • ACTIVATED CARBON • COKE • CEMENT • PIG IRON

When inquiring check CP 4087 opposite last page

MATERIALS

Tells all about solvent recovery using activated carbon

Technical data on activated carbon and Columbia activated carbon system of solvent recovery are presented in 36-page booklet. The efficiency and economy of this system for recovering solvent vapors are described. In addition to describing the operation, and its applications, lower explosive limits for solvents in air are given.

Form 4410D is issued by Carbide & Carbon Chemicals Co., a div. of Union Carbide and Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. When inquiring check CP 4088 on form opposite last page.

Microglass fibers and binder form thin surfacing film or backing material . . .

variety of electrical, chemical properties can be obtained

Uses: As a surfacing sheet for high and low-pressure laminates or as backing material for volume-production sheet products such as mica.

Features: Microglass fibers and binder form a thin, soft film. Chemical, electrical, and thermal properties can be varied to a great degree by choice of binder.

Description: Film is available in thicknesses ranging from 0.5 to 13 mils and widths up to 40". Binders used are melamine, epoxy, silicone, polyvinylchloride, polytetrafluoroethylene, and polyester preparations. Wet strength is approximately 70% of dry tensile strength which ranges from 95 to 880 psi. Breaking strength varies from 200 to 1350 grams per inch of width.

(Tissuglas film is a product of Commerical Development Div., American Machine & Foundry Co., Dept. CP, 261 Madison Ave., New York 16, N.Y. . . . or for more information check CP 4089 on form opposite last page.)

Eliminates spraying of cotton to control aphids, thrips, or mites . . .

systemic insecticide applied directly to seed protects growing plant for nine weeks

Uses: Protecting growing cotton plants from attack of aphids, thrips, mites, and other insect pests.

Features: Systemic insecticide is applied di-

rectly to cotton seed. It stays in growing plants and continues to kill insects for periods up to nine weeks after plant has come through ground. No spraying of plants is necessary.

Description: Compound is O,O diethyl S-isopropylmercaptomethyl dithiophosphate and has been labeled Thimet by manufacturer. Estimates at present are that compound will add about \$3.00 per acre to cost of untreated seed. Tests on corn, peas, beans, lettuce, beets, peanuts, potatoes, tree fruits, and tobacco seedlings have been promising.

(Thimet is a product of American Cyanamid Co., Dept. CP, 30 Rockefeller Plaza, New York 20, N.Y. . . . or for more information check CP 4090 on form opposite last page.)

**Easy-to-handle replacement
for liquid hydrofluoric acid
also activates other acids . . .**

one pound of powder liberates same amount of HF as 1.35 pounds of 52% acid

Uses: As a replacement for liquid hydrofluoric acid and as an activating agent for other mineral acids used in pickling, etching, or cleaning.

Features: Material is much less hazardous to handle than HF, because it is a crystalline solid. In metal cleaning, it permits faster pickling and removes siliceous films.

Description: Agent is a crystalline product that contains soluble fluorides. One pound will liberate same amount of HF as 1.35 lb of 52% acid, or 1.17 lb of 60% HCl. Concentration of 1 oz/gal is recommended for addition to usual pickling solutions. About one lb/gal is required in preparing a nitric acid solution for etching aluminum, for example.

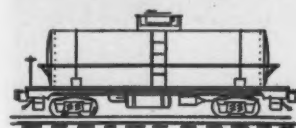
(Actane 70 is a product of Enthone, Inc., Dept. CP, 442 Elm St., New Haven, Conn. . . . or for more information check CP 4091 opp. last page.)

**Soya bean alkyd/pentaerythritol
system for surface coatings**

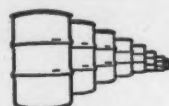
Three bulletins describe how three vehicles are all that are needed to cover major wants and needs of manufacturers of industrial finishes. Soya bean alkyd/pentaerythritol vehicles are described in these bulletins, and typical formulations and properties of many surface coatings are given.

"3 for All in Odorless Thinner," "3 for All in Mineral Spirits," and "3 Unusual Alkyds for Industrial Finishes" are issued by The Thibaut & Walker Co., Inc., Dept. CP, PO Box 296, Newark 1, N.J. Specify CP 4092 opp. last page.

AVAILABLE IN



TANK-CAR
AND



DRUM QUANTITIES

Du Pont
Hexalin®

Cyclohexanol

Whether you require one drum or tank-car lots, delivery of "Hexalin" is made promptly upon receipt of your order.

"Hexalin" is shipped as follows:

- Tank cars—8,000-gallon and 10,000-gallon capacities.
- Non-returnable drums, 55-gallon capacity—net weight: 430 lbs.

Investigate
DU PONT
HEXALIN®

Cyclohexanol (C₆H₁₁OH)

SPECIFICATIONS:*

- Boiling Range at 760 mm.: 160.0°C. Min. to 162.4°C. Max.
- Specific Gravity 25°/25°C.: 0.946-0.950

PROPERTIES

- Clear, colorless, oily liquid with a camphoraceous odor
- Soluble in water at 20°C. to the extent of 3.6% by weight
- Water is soluble in "Hexalin" at 20°C. to the extent of 11% of weight
- Miscible with: Ethanol, ethyl ester, linseed oil, petroleum solvents, aromatic hydrocarbons and most other common organic solvents
- Dissolves alkyd resins, alcohol-soluble phenolic resins, ethyl cellulose.

PRINCIPAL USES

PLASTICS: Ingredient used in the manufacture of ester plasticizers.

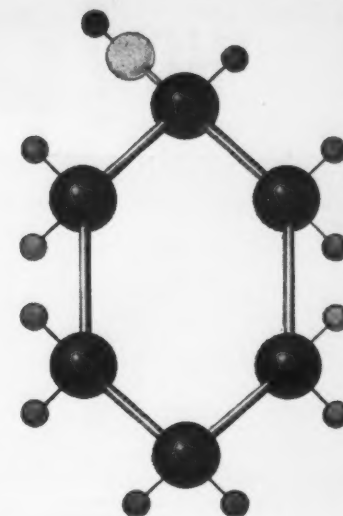
DETERGENT: Stabilizer and homogenizer for soap and synthetic detergent emulsions.

PETROLEUM: Intermediate for lubricating oil additives.

TEXTILES: Stabilizer and homogenizer in textile soaps; stabilizer for emulsions; solvent for dyes; kier boiling assistant.

FINISHES: Solvent in lacquers, shellacs and varnishes; high boiling solvent in nitrocellulose lacquers to retard evaporation and prevent blushing.

*Partial Listing



METAL: Degreasing agent; solvent in metal polishes.

MISCELLANEOUS: Dry-cleaning fluid ingredient; solvent in furniture polishes, shoe creams and floor waxes.

GENERAL ADVANTAGES

"Hexalin" cyclohexanol is a good solvent for several classes of dyes including basic, chrome, some acid and the majority of acetate rayon dyes.

"Hexalin" does not dissolve cellulose nitrate, cellulose acetate, rubber, copal, dammar, or elemi.

To obtain full information on Du Pont "Hexalin," just mail the coupon below, or write on your letterhead today.



REG. U.S. PAT. OFF.
BETTER THINGS FOR BETTER LIVING
... THROUGH CHEMISTRY

Polychemicals
DEPARTMENT
CHEMICALS • PLASTICS

Which of these
other chemicals are
you interested in?

- ☐ Adipic Acid
- ☐ Crystal Urea
- ☐ Diglycolic Acid
- ☐ Hydroxyacetic Acid
- ☐ Hytrol® O Cyclohexanone
- ☐ Lorol® Fatty Alcohols
- ☐ Methanol

E. I. du Pont de Nemours & Co. (Inc.)
Polychemicals Dept. 583, Wilmington 98, Del.
Please send me full information on Du Pont "Hexalin" Cyclohexanol. I am particularly interested in using "Hexalin" for the following applications:

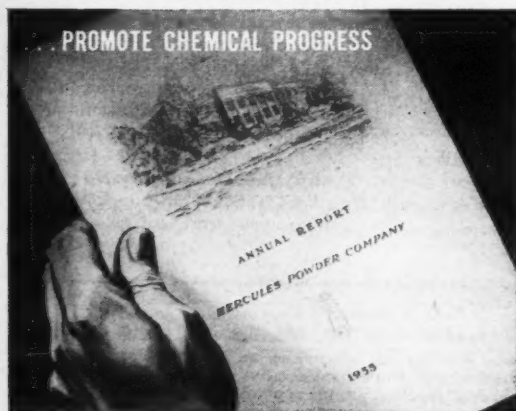
Name _____ Position _____
Firm _____
Address _____
City _____ State _____

When inquiring check CP 4093 opposite last page

HOW **HERCULES** HELPS...



THE NEW CONTINENTAL, Ford Motor Company's super-luxury car, is a quality product from bumper to bumper. Naturally, the finish is the finest available—lacquer based on Hercules® nitrocellulose. Quick drying and long wearing, versatile lacquer is the standard of quality wherever the finest in finishes is sought. (Lacquer for the Continental manufactured by Rinsed-Mason Co., Detroit, Mich.)



HERCULES' CONTINUING EXPANSION is reflected in an increase in sales from \$7,640,741 in 1913 to \$226,651,058 in 1955, 11,259 employees, and an unbroken history of consecutive dividends since Hercules' organization in 1913. Send for your copy of our annual report.



056-1

HERCULES POWDER COMPANY

940 Market St., Wilmington 99, Del. Sales Offices in Principal Cities

SYNTHETIC RESINS, CELLULOSE PRODUCTS, CHEMICAL COTTON, TERPENE CHEMICALS, ROSIN AND ROSIN DERIVATIVES, CHLORINATED PRODUCTS, OXYCHEMICALS, EXPLOSIVES, AND OTHER CHEMICAL PROCESSING MATERIALS.

HERCULES

CHEMICAL MATERIALS FOR INDUSTRY

When inquiring check CP 4094 opposite last page

MATERIALS

Addition of six viscosity ranges broadens use of synthetic oils in industry . . .

used where fire-resistance in functional fluids is a significant safety factor

Uses: As a replacement for flammable petroleum oil products in die-casting, metal-forming, and allied industries, as well as in compressed air service.

Features: Series of fire-resistant synthetic oils has been expanded to include hydraulic fluids and lubricants in six controlled viscosities. Use potential in industries where fire in functional fluids is a significant safety factor has been broadened.

Description: Viscosity ranges now available in Cellulube series are: 90, 150, 220, 300, 500, and 1000 SUS seconds at 100°F. Synthetic oils are described by manufacturer as straight phosphate esters.

(Synthetic oils are available from Celanese Corp. of America, Dept. CP, 180 Madison Ave., New York 16, N.Y. . . . or for more information check CP 4095 on form opposite last page.)

Cements nylon without curing and gives same properties as original material . . .

bonds are effective over wide temp ranges

Uses: Bonding nylon, both rigid and flexible, in fabricating and molding fields.

Features: Cement requires no curing and forms bonds that are effective over wide temperature ranges. Joints have strength and other characteristics of nylon itself.

Description: Material is available in wide range of viscosities and will fill in gaps that result when surfaces to be jointed are not perfectly matched. It has high resistance to oils, aromatics, aliphatic solvents, fruit acids, alkalis, and bleaches.

(Nylosil is a product of Ions Exchange Corp., Dept. CP, 44 Leonard St., New York 13, N.Y. Check CP 4096 opposite last page.)

Adds six chemicals to line

Six recent additions to manufacturer's line of chemicals are listed here. These pure chemicals are available on pilot plant scale.

Cadmium salicylate, white needles, used medicinally as an antiseptic.

MATERIALS

Calcium tetrphosphate, white powder.

Mercuric phosphate, white to yellowish-white powder.

Nickel sulfamate, green crystalline powder, used in nickel plating bath.

Sebacanilide, $(C_8H_5CONH)_2(CH_2)_8$, white powder melting at 201°C.

Zinc salicylate, white crystals, used medicinally as an antiseptic.

(These chemicals are products of City Chemical Corp., Dept. CP, 132 W. 22nd St., New York 11, N.Y. Check CP 4097 opposite last page.)

Excellent processing characteristics offered by phthalate plasticizer that has low volatility . . .

product resists oxidation and heat breakdown

Uses: As a monomeric plasticizer for use in applications where products are subjected to above normal atmosphere conditions.

Features: Plasticizer combines low volatility with excellent processing characteristics. It requires no antioxidant, yet resists oxidation and heat breakdown. Electrical properties are superior to DOP. Product has very good resistance to extraction and has a low rate of migration.

Description: An alkyl aryl phthalate, plasticizer has a volatility one-half that of DOP. This volatility is lower than any other available phthalate plasticizer. Its processing characteristics and vinyl resin compatibility are the same as DOP. As far as electrical properties are concerned, plasticizer's insulation resistance is 13,000 megohms/1000 ft @ 15.6°C.

(Cabflex HS-10 is a product of Godfrey L. Cabot, Inc., Dept. CP, 77 Franklin St., Boston 10, Mass. Check CP 4098 opposite last page.)

Covers many aromatic solvents and solvent oils

A variety of aromatic solvents and non-drying solvent oils derived from coal tar or petroleum is covered in six-page folder. They cover a complete range from low to high boiling solvents. In addition to descriptive information and data tables, the bulletin includes test and analysis methods and a full-page chart that shows each solvent's boiling range at a glance.

"Picco Solvents and Solvent Oils" is issued by Pennsylvania Industrial Chemical Corp., Dept. CP, Clairton, Pa. Specify CP 4099 opp. last page.



**alkyds . . .
for polyurethanes
call for better glycols . . .**

The quality of polyurethanes depends on the quality of the alkyds used in their production. In turn, the quality of the alkyds depends on the quality of the chemicals used in *their* manufacture.

Producers of alkyds for polyurethanes have found that Mathieson glycols have the necessary purity and uniformity to maintain control of end-product quality.

Mathieson ethylene glycol and diethylene glycol are shipped in tank cars, compartmented cars, tank trucks and resin-lined drums. These and other basic chemicals are strategically stocked to assure prompt delivery. Mathieson also provides expert technical assistance on manufacturing problems. Contact us whenever we may be of service.



MATHIESON CHEMICALS

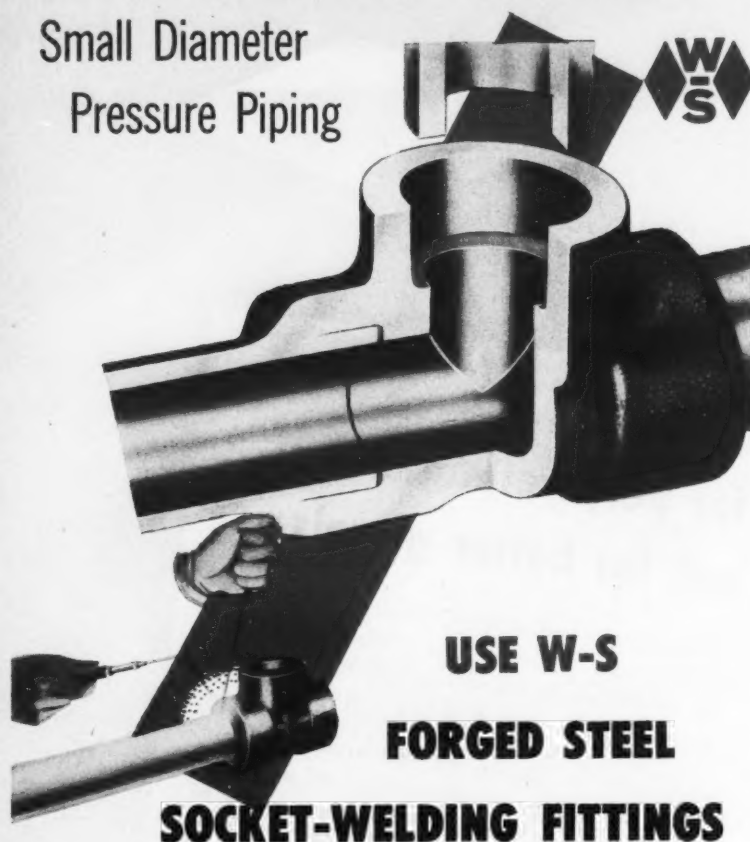
OLIN MATHIESON CHEMICAL CORPORATION
INDUSTRIAL CHEMICALS DIVISION • BALTIMORE 3, MD.

INORGANIC CHEMICALS: Ammonia • Bicarbonate of Soda • Carbon Dioxide • Caustic Potash • Caustic Soda • Chlorine • Hydrazine and Derivatives • Nitric Acid
Hypochlorite Products • Muriatic Acid • Nitrate of Soda • Soda Ash • Sodium Chlorite Products • Sulphate of Alumina • Sulphur (Processed) • Sulphuric Acid
ORGANIC CHEMICALS: Ethylene Oxide • Ethylene Glycols • Polyethylene Glycols • Glycol Ether Solvents • Ethylene Dichloride • Dichloroethylene • Formaldehyde
Methanol • Sodium Methylate • Hexamine • Ethylene Diamine • Polyamines • Ethanolamines • Trichlorobenzene • Polychlorobenzene • Trichlorophenol

When inquiring check CP 4100 opposite last page

Here's the **EASY WAY TO WELD**

Small Diameter
Pressure Piping



**USE W-S
FORGED STEEL
SOCKET-WELDING FITTINGS**

In addition to providing high strength and toughness, W-S Forged Steel Socket-Welding Fittings are also easy to install. Deep sockets support and align the pipe for welding... eliminating the need for tack welding or special fixtures. No back-up ring is needed either. The fillet-weld is completely outside the pipe. Welding icicles just can't form inside the pipe. The result is a clean, tight welded joint that will readily resist high pressures and the stresses of shock and vibration. What's more, installation costs are lower.

W-S Socket-Welding Fittings are available in sizes 1/8" to 4" for schedule 40, 80, 160 and double-extra heavy pipe in carbon steel, stainless steels and alloy steels.

For complete information on the installation and operation advantages of W-S Forged Steel Socket-Welding Fittings, send today for Bulletin A-3-56.

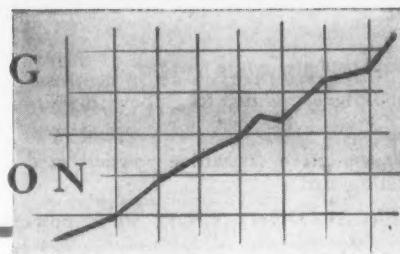


W-S FITTINGS DIVISION

H. K. PORTER COMPANY, INC.
Roselle, New Jersey

When inquiring check CP 4101 opposite last page

EXPANDING CHEMICAL PRODUCTION



Add phosphoric acid unit to Tuscola plant

U.S. Industrial Chemicals Company, Division of National Distillers Products Corporation, is adding a wet-process phosphoric acid plant to its Tuscola, Illinois, installation. Process was developed by S. A. Metallurgique de Prayon, a Belgian company. Plant will produce 60,000 tons annually of 75% phosphoric acid, using sulfuric acid and phosphate rock. Construction will be completed by end of 1956. U.S.I. already produces sulfuric acid, ammonia, and nitrogen solutions at Tuscola.

Plans big boost in output of titanium dioxide

Du Pont's titanium dioxide plants at Edge Moor, Del., and Baltimore are to be expanded to increase company's output of the white pigment by more than 25%. First new facilities at Edge Moor will be completed by autumn of 1956. The Baltimore expansion and a second expansion at Edge Moor will be completed in 1957. Engineering studies are also being made to construct a TiO₂ plant near New Johnsonville, Tenn., with initial production anticipated in 1958.

To spend half million dollars for more cement capacity

Further expansion of its Neville Island cement plant is being planned by Pittsburgh Coke & Chemical Company. Expansion will cost half million dollars and will increase capacity by 400,000 barrels. Despite earlier expansions, cement demand has exceeded capacity for several years. Pittsburgh Coke anticipates a further growth in cement demand in Pittsburgh area because of the number of

dams and sewage system projects authorized or under construction. The Neville Island plant is located in the Ohio River near Pittsburgh, Pa.

Expect titanium plant start-up in September, 1956

Titanium sponge plant of Electro Metallurgical Company, Division of Union Carbide and Carbon Corporation, is expected to be in production by end of September, 1956. Annual capacity will be 7500 tons. Process will be sodium reduction of titanium tetrachloride, a method developed in Electromet's Metals Research Laboratories.

Further diversifies line of fertilizers

Plant to produce 200,000 tons annually of triple super-phosphate will be built at Brewster, Fla., to further diversify American Cyanamid's line of chemical fertilizers. Decision was prompted by increased demand by agriculture for higher analysis mixed fertilizers and to take advantage of one of Cyanamid's basic raw materials—phosphate rock. Plant will be built on existing Cyanamid site at Brewster.

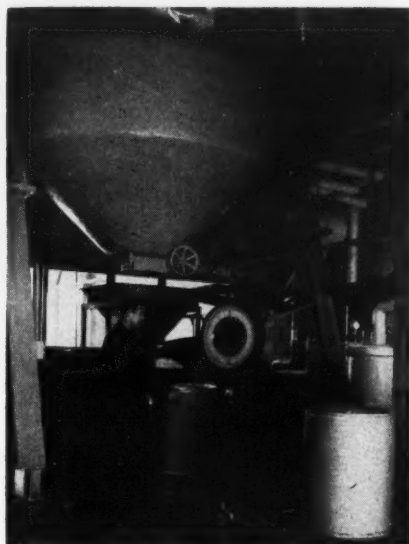
Another aluminum reduction unit for Listerhill, Alabama

Reynolds Metals Company will build an aluminum reduction plant at Listerhill, Alabama. Cost will be approximately 80 million dollars and capacity will be 200,000,000 lb of raw aluminum per year. Approximately one-third of the output will be delivered in a molten state to a Ford Motor Company foundry on an adjacent site.

**News about chemical materials in the US —
plant construction, increased production . . .
on stream now or planned for future**

**Completes reagent process units
for tonnage production**

J. T. Baker Chemical Company has completed installation of unit process equipment for manufacture of high-purity inorganic chemicals. Equipment includes a stainless steel blender with capacity up to 10,000 lb



from which the highly purified and reagent-grade chemicals will be packaged directly. (See photo) Reaction vessels and crystallizers are stainless steel or glass lined. These facilities were installed to allow tonnage production of highly purified inorganic chemicals.

**News about Phillips Chemical
—more rubber and ammonia**

Synthetic rubber plant capacity at Borger, Texas, will be expanded again by Phillips Chemical Company. Annual capacity of the synthetic rubber will be increased by 30,000 long tons. Annual capacity of adjacent butadiene will be boosted by 24,000 short tons.

Anhydrous ammonia plant to be located near Finley, Washington, will be operated by Phillips Chemical Company after it has

been built by Phillips Pacific Chemical Company. Phillips Pacific is owned jointly by Phillips Petroleum Company and Pacific Northwest Pipeline Company. Plant is scheduled for completion late in 1956. Raw material will be natural gas supplied by Pacific Northwest. Capacity will be 200 tons per day of anhydrous ammonia.

**Adds tall oil recovery plant
to Jessup operation**

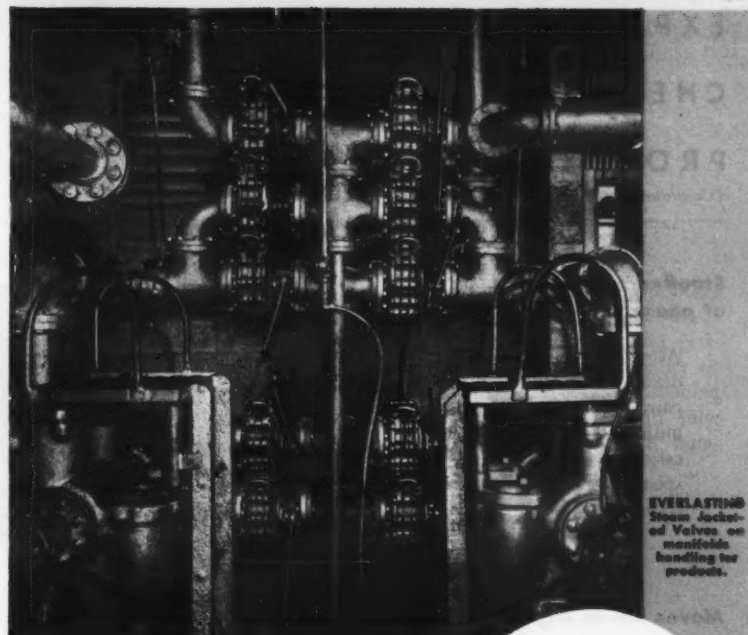
Rayonier Incorporated will build a tall oil plant at its chemical cellulose operation at Jessup, Ga., to utilize raw materials not only from the present cellulose unit but also from the new mill under construction. Tall oil produced will be shipped to the Hercules Powder Company plant at Savannah for further processing. Tall oils are used in the paint, paper, rubber, textile, and chemical industries.

**120 million dollars will build
an aluminum plant**

Olin Mathieson Chemical Corporation will build an aluminum plant in the Ohio Valley near Clarrington, Ohio. Initial investment will be 120 million dollars for both the aluminum plant and power facilities. Alumina plant capacity will be 230,000 tons annually of which only 115,000 tons will be required, at first, for the aluminum plant. Surplus 115,000 tons of alumina will be sold on the market.

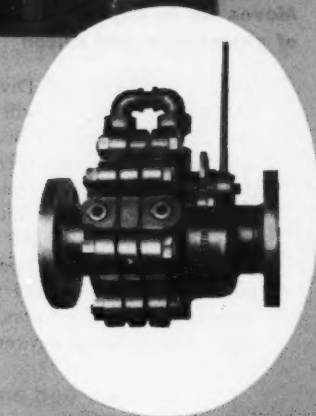
Aluminum plant capacity will be 60,000 tons per year and most of it will be consumed by the Metals Division of Olin Mathieson. Bauxite, major raw material required, will be shipped from Surinam (Dutch Guiana). Coal will be mined on the site to provide the large power requirements. Approximately two million tons of coal per year will be required initially. This is to be supplied by the Pittsburgh Consolidation Coal Company.

(Please turn to next page)



EVERLASTING
Steam Jacketed
Valves on
manifolds
handling for
products.

**Jacketed
Valves**
that keep
Viscous Materials
flowing freely



Note these features:

for
coal tar products,
asphalt, pitch,
resins, varnish,
waxes, paraffin,
molten sulfur,
etc.

Extra-large jacket space
Straight-through flow
Drop-tight seal
Non-wedging discs
Quick-acting lever

Write for descriptive bulletin and
our 60-day free trial offer.

For "everlasting" service, use
EVERLASTING
Valves

EVERLASTING VALVE CO.
73 FISK STREET, JERSEY CITY 5, N. J.

When inquiring check CP 4102 opposite last page

EXPANDING CHEMICAL PRODUCTION

(Continued from preceding page)

Stauffer establishes reserve of phosphate rock

After nearly five years of exploration and development work, Stauffer Chemical Company has established the existence of a five million ton reserve of phosphate rock. Location is near Bear Lake, Idaho. Stauffer spent four hundred thousand dollars to complete the project.

Moves lab to expand production of germanium and silicon

Tungsten and Chemical Division of Sylvania Electric Products, Inc., will expand production of germanium and silicon, once a new laboratory building has been completed. All development and pilot plant operations are to be brought together into the one building. Space made available will be used to expand manufacturing operations. Germanium and silicon are key materials in the manufacture of transistors, crystal diodes, other semiconductor devices.

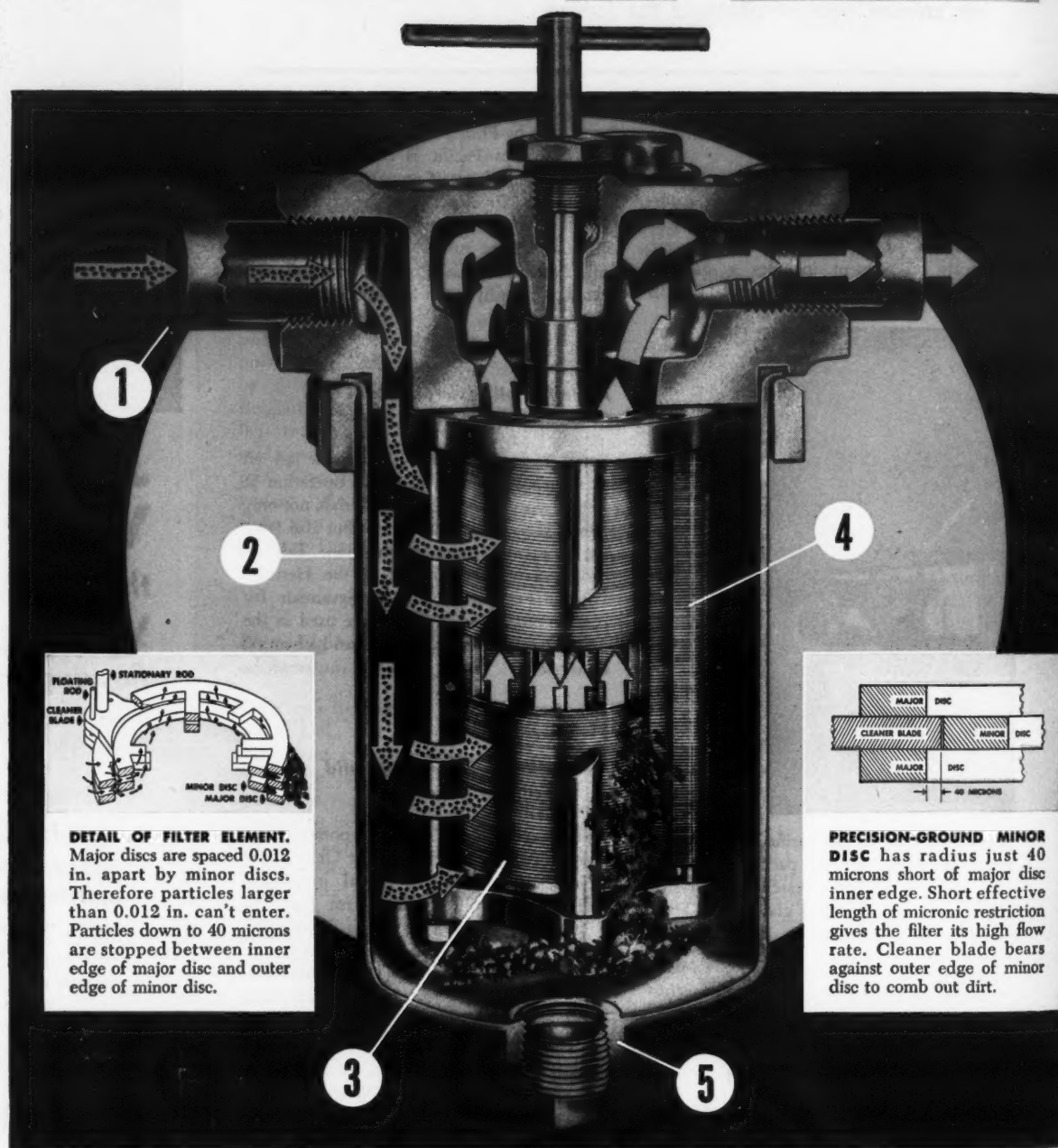
Third Kraft unit for Charleston to cost twenty million

Preliminary construction has already started for installation of a third Kraft machine at Charleston, S. C., by the West Virginia Pulp and Paper Company. Cost, including supporting equipment and additional power facilities, will be approximately twenty million dollars. Production is expected by August, 1957. Mill capacity at Charleston will be increased from 955 to 1350 tons per day. This machine will manufacture lighter grades of Kraft paper, allowing one of the existing machines to concentrate on production of Kraft linerboard.

Plastic pipe potential pushes polymer production

Naugatuck Chemical Division of United States Rubber Company plans construction of a five million dollar plant near Baton

New! CUNO 40-micron



DETAIL OF FILTER ELEMENT. Major discs are spaced 0.012 in. apart by minor discs. Therefore particles larger than 0.012 in. can't enter. Particles down to 40 microns are stopped between inner edge of major disc and outer edge of minor disc.

PRECISION-GROUND MINOR DISC has radius just 40 microns short of major disc inner edge. Short effective length of micronic restriction gives the filter its high flow rate. Cleaner blade bears against outer edge of minor disc to comb out dirt.

CUTAWAY of new SUPER Auto-Klean. Dirty liquid enters inlet (1) at left, fills housing (2) and flows through metal-edge filter (3) of stacked major and minor discs. Trapped dirt is combed out by cleaner blades (4) when discs are rotated and is removed through drain (5). Clean liquid rises through center of filter element, leaves at right.

n self-cleaning filter!

The SUPER Auto-Klean FOR PROCESS LIQUIDS

... and you can clean this filter by simply turning the handle!

Many times smaller than other micronic filters of equal capacity, Cuno's new SUPER Auto-Klean filter now makes possible economical, compact, micronic filtration at high flow rates and eliminates the need for replacement cartridges. Here's what SUPER Auto-Klean offers the process industries:

1. Micronic filtration with a self-cleaning filter. Filter can be cleaned continuously with motor drive or intermittently by manually turning handle.
2. Eliminates cartridge changes. Ends operating costs if you've been using cartridge filters.
3. No pressure drop build-up. An 8-in. long, 2½-in. diameter cartridge handles 30 gpm of liquid at 50 centipoise viscosity with only 3 psi pressure drop—up to 75% more with slightly higher pressure drop.
4. Positive protection against particles larger than 40 microns (actually 0.0015-in.). Filter can't rupture or channel.
5. Much smaller than replaceable-cartridge-type filters of equal capacity, you save on lower initial costs,



ENGINEERED FILTRATION

Removes More Sizes of Solids from More Kinds of Fluids
AUTO-KLEAN (edge-type) • MICRO-KLEAN (fibre cartridge)
FLO-KLEAN (wire-wound) • PORO-KLEAN (porous stainless steel)

lower installation costs, lower space requirements than for cartridge units. You get high capacity in a small package.

6. No duplex units needed. Handles full flow all the time with no interruptions for cleaning.
7. SUPER Auto-Klean fits existing Auto-Klean housings. You can easily replace most 2½-in. diameter cartridges with SUPER Auto-Klean for finer filtration.
8. SUPER Auto-Klean is available in all-steel or type-316-stainless-steel construction with Teflon seal.

Typical SUPER Auto-Klean installations

1. 50 gpm of organic solution, viscosity 100 to 130 cps at 80°C operating temperature and 125 psi operating pressure—40-micron filtration.
2. 1.2 gpm of polyethylene, viscosity 50,000 cps at 340°F, operating pressure of 2,000 psi and pressure drop of 800 to 900 psi—40-micron filtration.
3. 10 gpm of resin, 2,000 SSU at 500°F and 100 psi operating pressure—40 micron filtration.
4. 10 gpm of printing ink—40 micron filtration.
5. 20 gpm of coating liquid—40 micron filtration.
6. Phenolic water at 125 psi operating pressure on pumps—40 micron filtration.
7. 150 gpm of wax—40 micron filtration.

MAIL COUPON FOR COMPLETE INFORMATION

- | | | |
|-----------------------------------------------------|---------------------------------------------------|------------------------------------------------------------|
| <input type="checkbox"/> Absorption oils | <input type="checkbox"/> Fuel tar | <input type="checkbox"/> Photographic developing solutions |
| <input type="checkbox"/> Acids | <input type="checkbox"/> Gasoline | <input type="checkbox"/> Pickling brines |
| <input type="checkbox"/> Alkali | <input type="checkbox"/> Glacial acetic acid | <input type="checkbox"/> Pyroxylin |
| <input type="checkbox"/> Casein | <input type="checkbox"/> Grease | <input type="checkbox"/> Resins |
| <input type="checkbox"/> Cellulose acetate | <input type="checkbox"/> Industrial alcohols | <input type="checkbox"/> Rust proofing compounds |
| <input type="checkbox"/> Chlorinated solvents | <input type="checkbox"/> Japan | <input type="checkbox"/> Sizing |
| <input type="checkbox"/> Cleaning solutions | <input type="checkbox"/> Lacquers | <input type="checkbox"/> Solvents |
| <input type="checkbox"/> Coal tar solvents | <input type="checkbox"/> Nitrocellulose Solutions | <input type="checkbox"/> Tar |
| <input type="checkbox"/> Coatings | <input type="checkbox"/> Nitrogen | <input type="checkbox"/> Varnishes |
| <input type="checkbox"/> Enamels | <input type="checkbox"/> Paint | <input type="checkbox"/> Water and water solutions |
| <input type="checkbox"/> Ethylene Glycol | <input type="checkbox"/> Paraffin | <input type="checkbox"/> Wax |
| <input type="checkbox"/> Ethyl and methyl cellulose | <input type="checkbox"/> Petroleum solvents | <input type="checkbox"/> Other _____ |

CUNO ENGINEERING CORPORATION

5-3 South Vine Street, Meriden, Conn.

Please send me full data on the NEW Cuno SUPER Auto-Klean filter.

Name _____

Firm _____

Position _____

Address _____

City _____ Zone _____ State _____ 5.8

EXPANDING CHEMICAL PRODUCTION

Rouge, La., for production of copolymer called Kralastic. Largest single use today is in manufacture of chemically resistant plastic pipe. Company's production capacity of the copolymer will be more than doubled by completion of the new plant in July, 1957. Material is based on styrene, butadiene, and acrylonitrile.

Next synthetic latex plant will be on West Coast

Part of Dow's \$75 million expansion program for 1956 will include a \$1 million synthetic latex plant to be built at Pittsburg, Calif. Construction of the West Coast plant has already started and production is expected by fall. Plant will produce a broad range of styrene-butadiene latices used in manufacture of paints, coated papers, and other products. Dow already has two synthetic latex plants in the U. S.

Completes \$300,000 addition to fertilizer plant

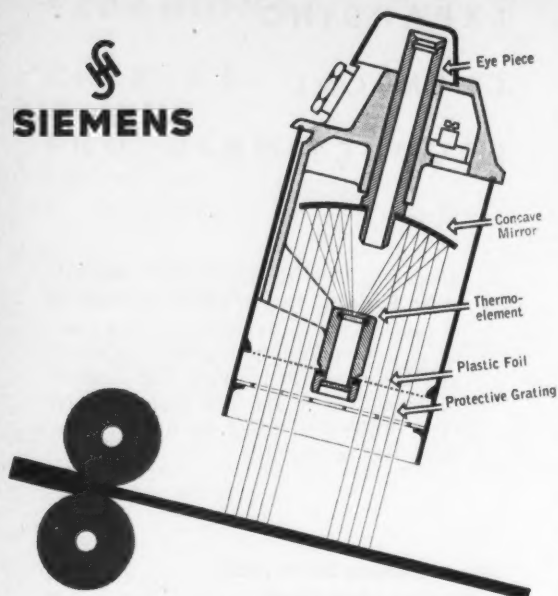
Capacity of the Perry, Iowa, fertilizer plant of Davison Chemical Co., Division of W. R. Grace & Co., has been increased by approximately 50% at a cost of nearly \$300,000. New facilities will allow production of a higher concentration or analysis, as 15-15-15 with graded particle sizes free of dust. Facilities already installed include a large granulation unit.

Doubles production capacity for methyl siloxane

With completion of a unit for doubling production capacity for methyl siloxane, Dow Corning Corporation has finished a \$16 million expansion program for production of dimethyl silicone fluids and emulsions. Dimethyl silicones are used for mold lubricants, liquid springs, anti-floating agents in paints, special lubricants for rubber and plastics.

When inquiring check CP 4103 opposite last page

SIEMENS



Difficult Pyrometric Problems

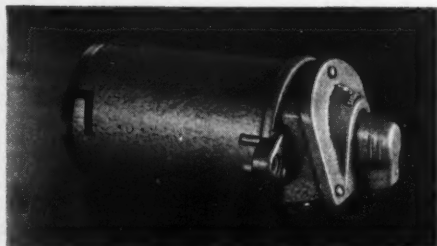
arise if special processes are to be investigated. Our Radiaton Pyrometer

ARDONOX

which responds to infrared radiation, readily lends itself for a great variety of modern solutions in indicating, recording, and controlling temperature values, because its application is extended to the lower ranges, down to freezing point.

The ARDONOX is specially suited for measurements on moving bodies whose surface temperature is determined without influence of the surrounding air.

At the German Industries Fair in Hannover, Hall 9, we are exhibiting Electrical Instruments, Automatic Controllers and Equipment for Non-destructive Material Testing.

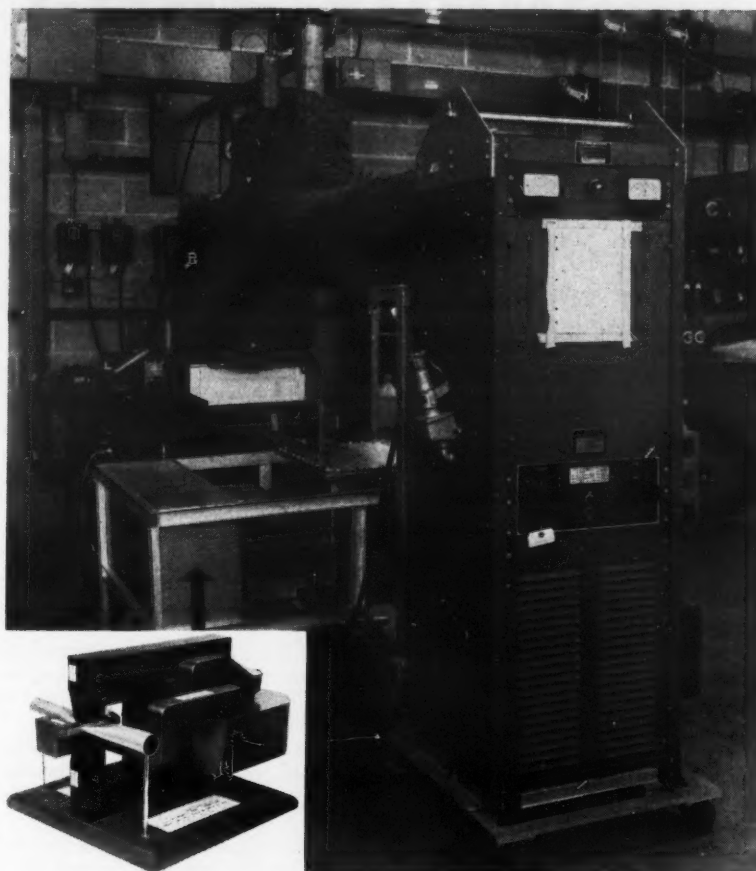


Cal 58 E

SIEMENS & HALSKE AKTIENGESellschaft
WERNERWERK FÜR MESSTECHNIK · KARLSRUHE
WEST GERMANY

When inquiring check CP 4104 opposite last page

ideas — from other industries and nuclear field . . .
new trends in research, processes, services



Closed loop system being used in corrosion test at Argonne. AC electromagnetic pump is behind shield. Inset shows AC electromagnetic pump. Liquid metal being handled moves through tube shown in front

AC electromagnetic pump, in combination with DC unit, has been used in atomic energy laboratory for more than a year with —

No NaK Leakage

Pump operates on conventional 220v, needs no maintenance or packing

GORDON WEYERMULLER, Associate Editor
With **FRED A. SMITH**, Associate Physicist
Argonne National Laboratory, Lemont, Ill.

ONE example of how an AC electromagnetic pump is being used to advantage at Argonne National Laboratory is in a dynamic sodium corrosion test for stainless steel. Probably the outstanding feature of the AC pump is that absolutely no leakage of NaK occurs.

Principal reason for the complete absence of leakage of the liquid metal being handled is that the AC pump is hermetically sealed and has no pack-

ing. Unit has required no maintenance in more than a year of operation. AC pump operates from a conventional 220v, 60c, single-phase power source.

In the research work, different weld combinations of five 300 series types of stainless steel are being studied. Alloys are welded to each other so that 25 combinations of 2" Schedule 5 pipe made from them are joined together. Sodium at 800°C is run through this pipe, which is installed inside a 4" pipe with vacuum in the annular space.

A change in pressure would indicate a leak in the 2" pipe, showing failure at one of the welds. Outer pipe contains leak to avoid hazard. It is not necessary to enclose entire system. A portion of the heat loss is saved by use of double wall.

When test is started up, AC electromagnetic pump is used to circulate NaK in the closed loop at 250-270°F. Advantage of using NaK is that it is a liquid at room temperature and is compatible with Na used later in test. After it is preheated with NaK, the system is charged with Na and the NaK is drained off. Na is then heated electrically from 270 to 1500°F and continuously circulated by means of a DC electromagnetic pump. When shutting down, NaK is used in a similar manner as in startup.

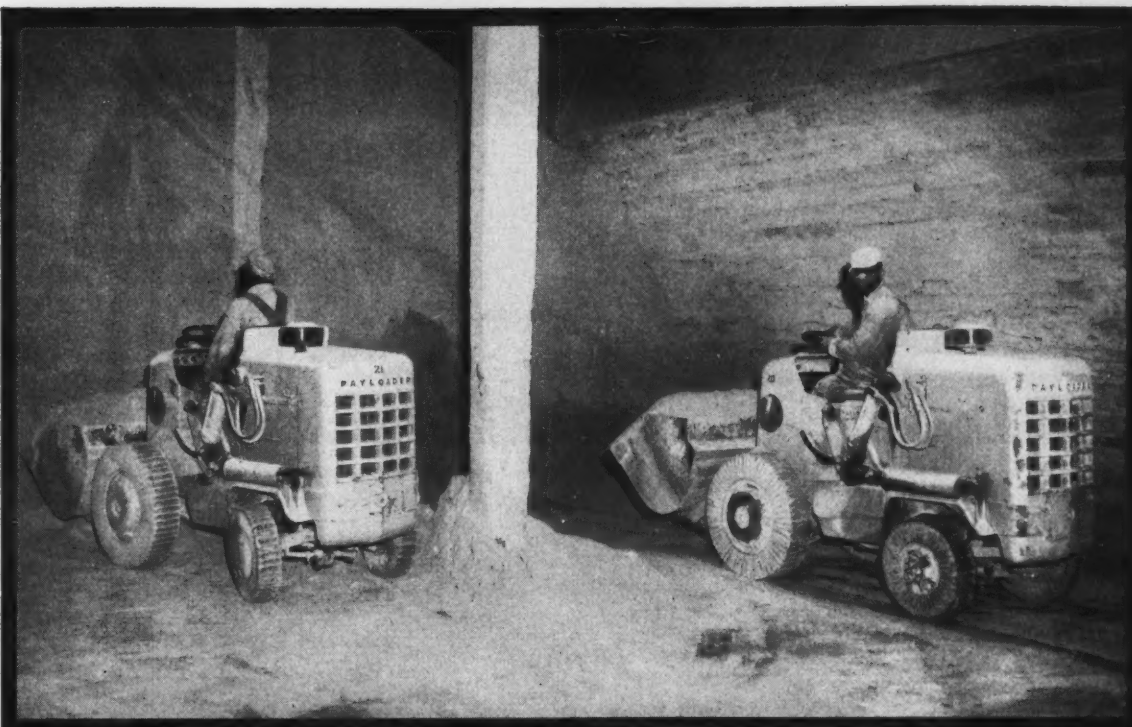
AC pump used in startup and shutdown operates on the principle of an electric motor. Force is exerted on a conductor carrying current in a magnetic field. Fluid being handled is the conductor in the electromagnetic pump. Pump has a rated flow of 20 gpm at 20 psi. Among advantages of AC pump besides those mentioned earlier are no moving parts, mounting in any position, and easy control of flow. It can be used for handling liquid metals and other low-resistance conducting fluids.

DC pump used in the test was built by Argonne. In fact, Argonne's Dr. Arthur H. Barnes is the inventor of the DC electromagnetic pump and has done much work in the development and successful application of it.

Chief advantage of the DC pump is that it operates at only one volt DC. Since no insulation is required at this low voltage, pump can easily be used at high temperatures. DC pump in use in this test has required no maintenance since placed in service. DC pump requires a current of about 1500 amp, which is not easily obtained economically.

(AC electromagnetic pump is product of General Electric Co., Dept. CP, One River Rd., Schenectady 5, N. Y. Check CP 4105 opposite last page.)

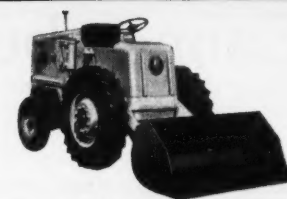
The alphabetical Product Directory (starting on page 213) will give you a page reference to all articles and advertisements in this issue



2 new-design PAYLOADER® shovels do the work of 4 previous units

The new-design model HA "PAYLOADER" has already proven that it is the production champion in its class. Long-time "PAYLOADER" users, as well as new owners, report new highs in production and new lows in bulk-material handling costs with the new HA. A typical report is from G. N. Williams, Supt. of Fertilizer Division of Planters Cotton Oil & Fertilizer Co. of Rocky Mount, N. C., who says, "On manufacturing operations two new-design 'PAYLOADER' shovels are doing the job of 4 previous units. These new HA's load faster and easier, travel faster with better operator vision and increased operator safety. On manufacturing operation, these two HA's move about 400 tons under a good day's run on an average haul of 75 feet. We are still operating three older 'PAYLOADER' shovels purchased in 1946."

If you have any bulk materials to scoop-up, carry, load, dump, stockpile or spread, you should find out how the new-design model HA or a larger "PAYLOADER" model can help. There's a Hough Distributor ready to show you.



For higher lifts and more capacity the new model HAH 1 cu. yd. capacity

THE FRANK G. HOUGH CO.
744 Sunnyside Ave., Libertyville, Ill.

- ☐ Send data on Model HA (18 cu. ft.)
- ☐ Send data on Model HAH (1 cu. yd.)
- ☐ On larger models up to 2 cu. yd.

Name

Title

Company

Street

City

State



PAYLOADER®
MANUFACTURED BY
THE FRANK G. HOUGH CO. LIBERTYVILLE, ILL.
SUBSIDIARY—INTERNATIONAL HARVESTER COMPANY



When inquiring check CP 4106 opposite last page

WHEN CORROSION IS CRITICAL

Optimum tube for the job = $\frac{(\text{pressure}) \times (\text{length}) \times (\text{allowable stress})}{(\text{flow rate}) \times (\text{cost/ft.})}$ Ni + % Cr, temp, atmos) +

Tube Selection Cannot be Reduced to a Formula — even a complicated one

Selection of the proper grade of stainless steel for a particular application is a relatively complex problem and involves manufacturing, metallurgical, chemical and economic considerations. Although it is complex it has been made easier by industrial research. Data accumulated through years of research and experience gained in helping to solve varied application problems are now available to guide the user in the solution of his present problems.

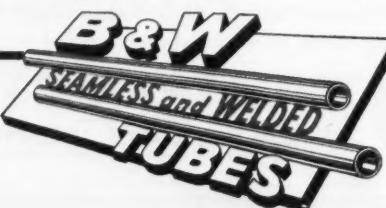
It is practically impossible to list all the media in which stainless steels will resist corrosion. It is even more difficult to enumerate all the conditions under which the stainless steels will resist effectively the corrosive effects of such media. Frequently, a relatively minor contami-

nant, when combined with the main reagent, will cause a more detrimental corrosive action than the latter by itself. This is particularly true of iron salts which, in the presence of chlorides, often prove to be a very potent corrodent, producing pitting.

It is always advisable to test a sample under actual operating conditions, especially before extensive untried installations are made. Proper tube selection starts with expert opinion, available to you through Mr. Tubes, your nearby B&W Tube Representative. There is no substitute for the kind of experience with pressure tubing problems you'll find at B&W. Ask Mr. Tubes for help in matching tubes to jobs.

THE BABCOCK & WILCOX COMPANY TUBULAR PRODUCTS DIVISION

Beaver Falls, Pa.—Seamless Tubing; Welded Stainless Steel Tubing
Alliance, Ohio—Welded Carbon Steel Tubing



TA-4061(P)

When inquiring check CP 4107 opposite last page

IDEAS

Folder lists nuclear reactor, rocket temperature conversion chart

Fahrenheit-centigrade temperature conversion chart for nuclear reactors and rocket engines is listed in eight-page folder dealing with refractories, high-temperature coatings, and other fusion-stabilized materials. Conversion chart covers 2000-18,000°F range.

Folder "Products for the Atomic Program" is issued by Refractories Division, Norton Company, Dept. CP, Atomic Products Section, Worcester 6, Mass. When inquiring specify CP 4108 on form opposite last page.

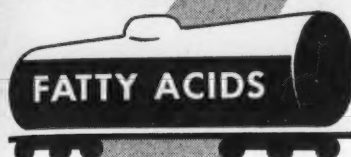


Butyrate sprinkler system covers 50 acres

Over 90,000 ft of lightweight, easy-to-handle, butyrate pipe was used to build 50-acre sprinkler system at Porterville State Hospital, Porterville, California. Extruded of Tenite butyrate plastic marketed by Eastman Chemical Products, Inc., Kingsport, Tennessee, sections are joined together by means of butyrate slip-sleeve couplings and solvent cement. Fittings were stored by size and shape, in drawers of mobile cabinets, which also served as workbenches.

(Butyrate pipe is extruded by Plastipipe, Inc., Dept. CP, 5544 West 104th Street, Los Angeles 45, California . . . or for more information check CP 4109 on form opposite last page.)

EL DORADO COCONUT OIL



FEATURE

CONTROLLED CHEMICAL COMPOSITION

... so you get better and easier control during processing ... plus a better, more uniform end product.

SPECIFY EL DORADO FOR

- PURITY
- SERVICE
- UNIFORMITY

ELDO CAPRYLIC ACID

94-96% pure

Eldo's high purity gives you better processing ... greater uniformity in your finished products.

FATTY ACIDS

CAPRYLIC	ELDHCO *	CAPRIC
LAURIC	COCONUT	MYRISTIC
	PALMITIC	

METHYL ESTERS

CAPRYLATE	ELDO 18 *	CAPRATE
LAURATE	COCONATE	MYRISTATE
CAPROATE		PALMITATE

*T.M. Reg.

For samples and specifications, write
Dept. P.



P. O. Box 599, Oakland 4, Calif.

When inquiring check CP 4110
opposite last page

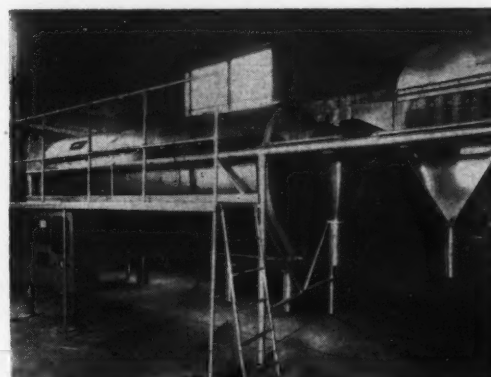
MARCH 1956

IDEAS

Study drying techniques with horizontal-type spray dryer

Pilot-plant-size horizontal spray dryer with nozzle atomization is being used for developing techniques for spray-drying chemicals, pharmaceuticals, foods, and other materials. In addition to all the normal advantages of a spray dryer, unit has other features which make it appealing for commercial applications.

Flexibility of operation is provided by wide variation of air flow, nozzle pressure, spray pattern, and other general operating conditions — all of which can be adjusted to provide desired qualities of finished



Products are dried in horizontal stainless steel chamber. Centrifugal and multi-cyclone collectors are connected to discharge end (right)

product most economically. The horizontal drying chamber is stainless steel and provides for drying temperatures up to 600-800°F.

Low headroom is a big advantage. Unit requires no more than is normally available in plants. Uniform operating conditions are maintained by automatic recording instruments. Dryer is reported as easy to clean.

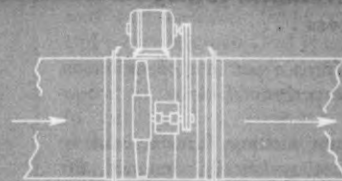
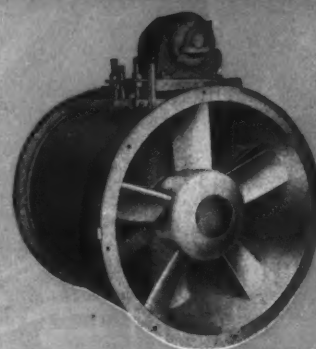
(Horizontal-type spray dryer was developed by Blaw-Knox Co., Dept. CP, Farmers Bank Building, Pittsburgh, Pa. Check CP 4111 opp. last page.)

Covers sewage disposal

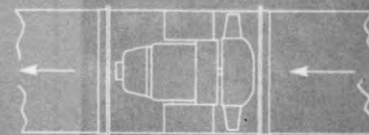
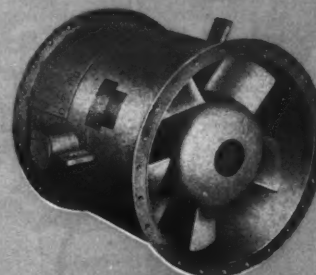
Processes by which sewage is reduced to safe, disposable water and sludge, are described in semi-technical publication. Literature evaluates various forms of sludge in comparison with animal manures and certain mineral fertilizers.

To obtain cir 972, "Sewage Sludge for Soil Improvement", remit 10c to Supt. of Documents, Government Printing Office, Washington 25, D.C.

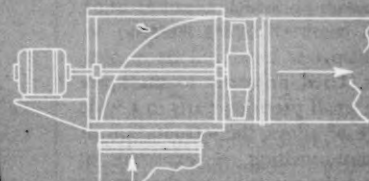
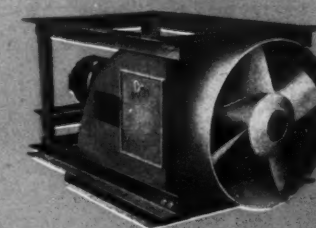
Large Volumes of Air -- with Low Power Consumption



WINGFOIL Straight-Line Duct Fan forms part of run of duct. V-belt drive through air tube. Motor on adjustable platform is outside air stream. Sizes: 21" to 60". Capacities to 95,000 CFM, pressures to 2" s.p.



WINGFOIL Vaneaxial Duct Fan. Direct connected motor inside casing. Motor is totally enclosed with sealed bearings. Sizes: 10" to 42". Capacities on application.



WINGFOIL Elbow Type Duct Fan forms elbow in duct system. Strong rectangular frame. Motor outside air stream. Direct or V-belt drive. Mount in any position. Sizes: 10" to 60". Capacities up to 85,000 CFM, pressure to 2" s.p.

WINGFOIL DUCT FANS are your best bet, because of their strong, light-weight, rugged design, and the highly-efficient Wingfoil axial flow fan, which delivers high air volumes against static pressures with remarkably low power consumption.

The three types of duct fan, shown above, come in a wide variety of sizes and capacities. They are designed to handle

hot or cold, dust-laden or corrosive air or gases and for exhausting or supplying air. Write for Bulletin. Use the coupon.

L. J. Wing Mfg. Co. 179 Vreeland Mills Road, Linden, N. J.

Factories: Linden, N. J. & Montreal, Can.



L. J. Wing Mfg. Co., Linden, N. J. CP-3
Please send me bulletin on WINGFOIL DUCT FANS.
Name.....
Firm.....
Address.....
City..... Zone..... State.....

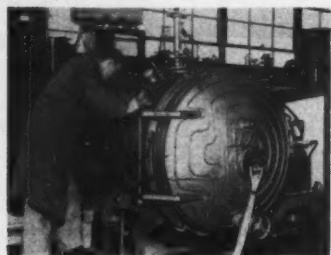


When inquiring check CP 4112 opposite last page

**Introduce vacuum melting
to investment casting
process . . .**

furnace put into operation on
experimental basis

Vacuum melting furnace, said to
be first specifically designed for
investment casting process, has
been put into operation on an ex-
perimental and pilot production



Vacuum melting furnace is ex-
pected to extend versatility of
investment casting process

basis. Used primarily to mass-pro-
duce small precision parts in a wide
range of alloys, the introduction of
vacuum melting is expected to
extend the versatility of the process
considerably.

Melting of metals in vacuum elimi-
nates harmful gases and undesirable
oxides and slag compounds. Ap-
pearance of these in a standard
melting process has limited the
choice of alloys used in investment
casting to those that are not affected
or affected only slightly by these
factors.

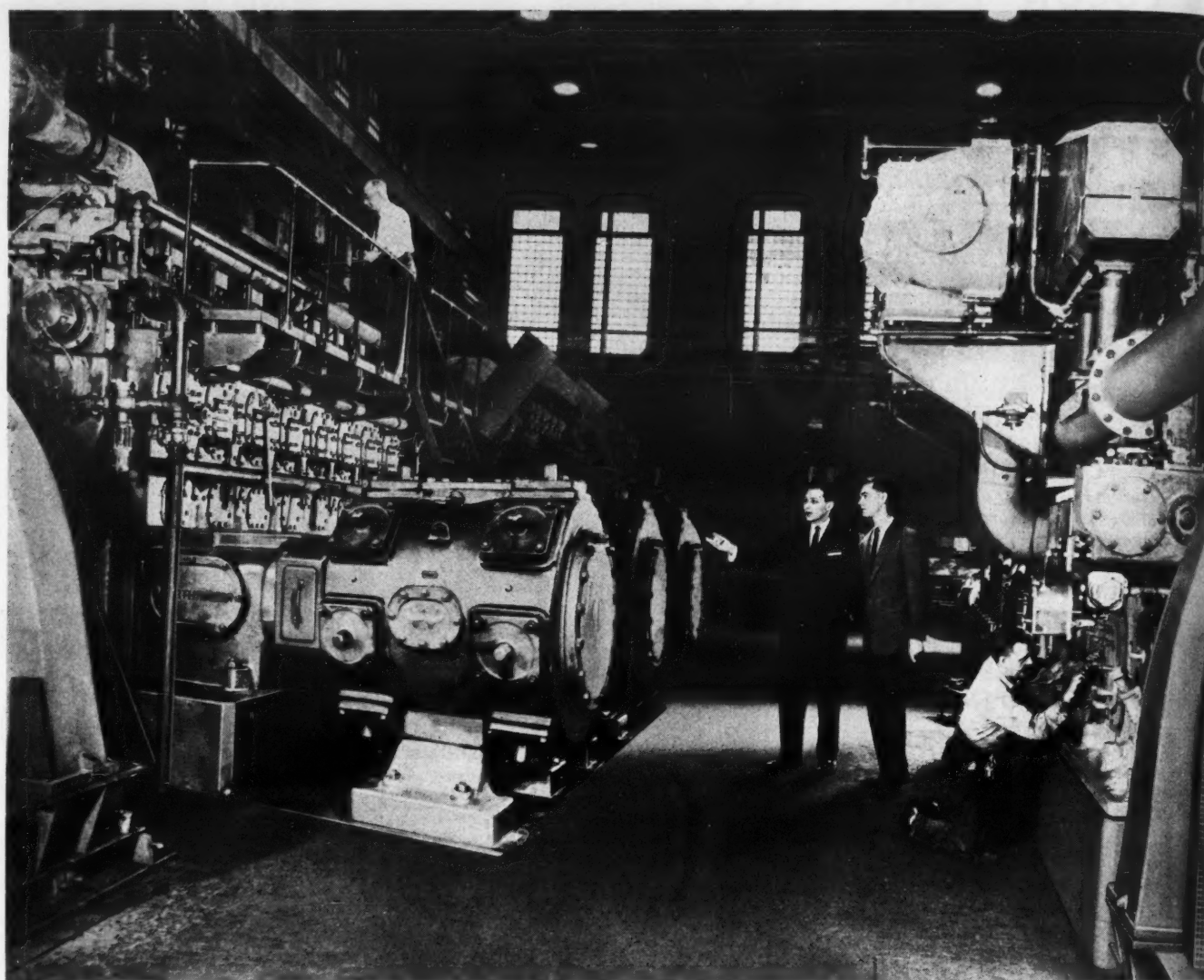
(Vacuum melting furnace is in-
stalled at Austenal Laboratories,
Microcast Division, Dept. CP, 224
E. 39th St., New York 16, N.Y.)

**AEC encourages industry
to process spent nuclear
fuel elements . . .**

will accept proposals from
firms to build, operate plants

As a further step toward private
ownership of atomic energy facili-
ties for peaceful uses, the Atomic
Energy Commission has approved
a program to encourage private

Complete process-flow flexibility



Progressive engineering gives you more for your engine compressor dollar in the TURBO-UNIFLO

AFTERCOOLING FOR MAXIMUM LOAD CAPACITY. Air
inlet manifold temperatures must be kept reasonably low
to maintain wide engine operational range and overload
capacity. This is important in high ambient temperature
locations. Low cycle temperatures reduce maintenance on
liners, heads, and pistons. Individual aftercoolers
mounted immediately adjacent each cylinder inlet give
maximum load capacity with accessibility.

MORE POWER FROM TURBO-UNIFLO DESIGN. Only
cam-operated, timed exhaust valves permit early opening
of exhaust to give complete evacuation of burnt gases,
and controlled closing for trapping maximum supercharg-
ing air. Coupled with pulse-generator ignition, this quiet
chain driven timing system gives top performance with
minimum maintenance.

The only turbocharged 2-cycle engine compressor with

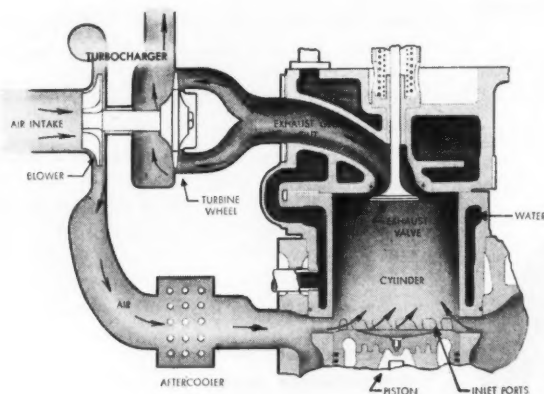
with 2-cycle compactness...

NO POWER-DRAINING EXTRA DRIVE FOR SUPERCHARGING WITH THE "TURBO-UNIFLO"— WORTHINGTON'S SUTC GAS-ENGINE COMPRESSOR

In its first production year this unique two-cycle turbocharged gas-engine compressor (750 to 2500 hp) has had remarkable process industries acceptance. Designed for quiet exhaust-powered pulse-type turbocharging on the basis of Worthington's extensive two-cycle engine-compressor experience, more than twenty-four TURBO-UNIFLO SUTC's are either installed or on order.

By integrating exhaust-powered turbocharging with field proven Worthington Uniflo scavenging design, Worthington engineers have developed a two-cycle engine-compressor unequalled for stability of

performance over the *complete* range of speed and load requirements. Operating at relatively high compression ratio, the TURBO-UNIFLO has much smoother combustion characteristics than other engines with lower compression ratios. This is due to the basic timing arrangement, engine configuration, and design of exhaust manifolding. Sufficient exhaust gas energy is applied at the turbocharger, from engine start-up through all speeds and loads, to give full turbocharged effect without added external mechanical means for driving the supercharger. Low fuel and lube oil consumption are other advantages.



TURBO-UNIFLO OPERATION — Exhaust valves are timed to open and generate a pressure pulse to move the turbine blades. This gives self-sustained starting and quick acceleration without external aid or mechanical drive. Blower delivers air under pressure to the aftercooler. Cooled air enters the cylinders through inlet ports 360° around the liner. During the scavenging period, the combustion chamber walls and valves are effectively cooled.

The Uniflo system is accepted as having highest scavenging efficiency. It also gives the best turbocharging-scavenge ratio due to complete absence of residual gases in the combustion chamber.

QUIETER OPERATION. Cast-iron exhaust manifolding—dry insulated, built-in air-pulse dampener, triple-strand silent camshaft chain, hydraulic valve lifters and elimination of any mechanically-driven air charging device assure quietness.

FEATHER VALVE. The feather valve is standard TURBO-UNIFLO equipment. It's the lightest, simplest and quietest valve—and operates with no impact!

For more details on the TURBO-UNIFLO, call your nearest Worthington District Office, or write Worthington Corporation, A&SP-Engines, Harrison, New Jersey.

WORTHINGTON



exhaust-powered turbocharging from start-up through full-load

IDEAS

industry to build and operate plants for chemical processing of irradiated fuel elements from research and power reactors. Goal is to have commercial processing plants in operation as it becomes necessary to process fuel elements from privately-owned power reactors. The Commission will make available: 1) Commission technology in field of chemical processing, and 2) limited amounts of certain irradiated fuel materials from AEC reactors, to firms which submit acceptable proposals to the Commission at a date to be specified.

Commission facilities may also be used by private firms for research and development, and training in connection with the chemical processing field. Costs of such utilization would be defrayed by the user. Full details of the program, together with certain classified information useful in the preparation of proposals, will be made available to all interested and qualified companies.

(Information on this program courtesy of United States Atomic Energy Commission, Washington 25, D. C.)

Announces computing, analysis facilities

Research organization's new facilities for programming and performing mathematical analyses, large-scale data reduction facilities, dynamical simulation problems, etc, are pictured and described in eight-page bulletin. The facility employs both digital and analog equipment.

Bul R-16 is issued by Cook Electric Company, Dept. CP, 2700 Southport Avenue, Chicago 14, Illinois. When inquiring specify CP 4113 on the convenient form which is located opposite last page.

For more information on product at left, specify CP 4114 see information request blank opposite last page.

WAUKESHA has the CORROSION-RESISTANT METALS to make the Quality Castings you need

to help solve your tough product design problems

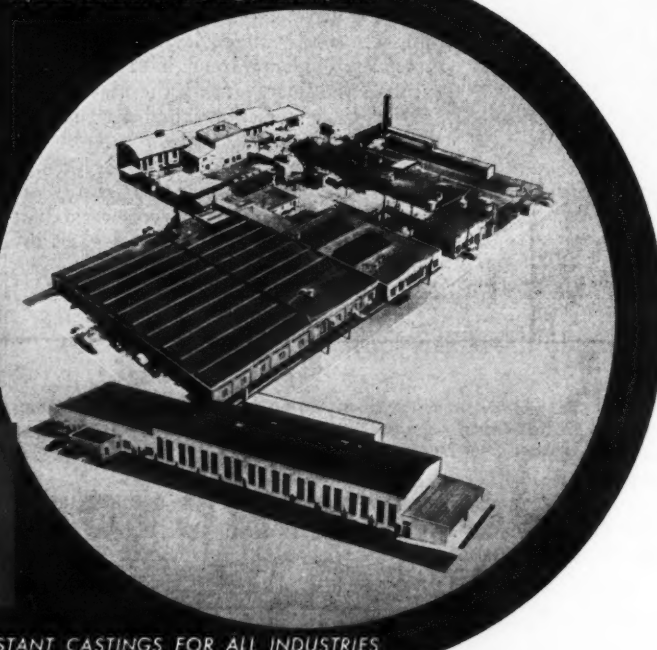
TYPE	Description and Application
STAINLESS STEEL	
GROUP I	Martensitic—straight chromium, hardenable. Machineable. Weldable. Magnetic.
403	High stress rotating parts. Turbine blades. Valve trim, oil refinery equipment, pump shafts.
410	Pinions, gears, shafts, aircraft fittings.
416	Ferritic—straight chromium, non-hardenable. Machineable. Magnetic. Corrosion resistance superior to Group I.
GROUP II	
430	Trim work exposed to atmosphere or water. Hardware.
442, 3, 6	Scale resisting. Furnace parts, baffles, blowers, trays.
GROUP III	Austenitic—chromium—nickel—non-hardenable.
302	Heat treating fixtures.
303	Food machinery equipment.
304	Dairy equipment. Magnetic traps.
305	Textile equipment.
309	Chemical equipment. Pump parts.
316	Chemical equipment. Condensers.
347	Pressure fittings.
WAUKESHA METAL	
	Copper base, high nickel content, corrosion-resisting alloy.
0	For high hardness. High tensile characteristics. Good wearing qualities.
1	Recommended for frictional parts.
3	Rather hard. Recommended for conveyor chain links, cams.
18	Recommended for use on shafts and applications involving pressure and high tensile strength.
23	Bearing alloy to be used in conjunction with stainless steel alloys for non-galling applications.
NON-FERROUS METALS	
Monel	Developed to meet requirements for specific application of corrosion resistance and bearing qualities.
Pure Nickel	Very high corrosion resistance.
Inconel	For specific corrosion resistance applications.
Aluminum	Exceptional bearing qualities, used where parts may be subjected to impact.
Bronze	Silicon bronze alloy. Corrosion resistance properties of copper and physical properties of mild steel.
Everdur	
Brass and Bronze	All grades available.
Aluminum	Alloys to meet all specifications available, including heat treat alloys.

Why Waukesha-Created Metals: To solve the manifold problems confronting engineers, Waukesha has mastered the foundry techniques of a wide variety of corrosion-resistant metals to meet present day casting design needs for equipment in many industries. If yours is a corrosion-resistant casting design problem of hardness, strength, elongation, wear resistance, bearing qualities, impact, scale resistance, seizing or galling, or intergranular corrosion among others—Waukesha has the metal and the casting know-how to solve it.

Quality Control: Metallurgical laboratory control of every production step, top engineering casting design, and skilled craftsmen guarantee you castings that are uniform, close-grained, free of porosity, metallurgical accurate in composition, and dimensionally correct . . . castings precisely to specifications . . . castings that stand up to the severe demands of today's designs.

Waukesha has the facilities to supply your production casting needs on schedule. We suggest that you write, today, for a casting quotation or engineering counsel on your casting designs. Waukesha Foundry Company, 5623 Lincoln Avenue, Waukesha, Wis.

Waukesha operates three distinct and separate foundries in two, large, modern plants.



Waukesha
Foundry Company
WAUKESHA, WISCONSIN

WAUKESHA: SPECIALISTS IN CORROSION-RESISTANT CASTINGS FOR ALL INDUSTRIES

When inquiring check CP 4115 opposite last page

IDEAS

Acid-resistant uniforms protect help, up morale at Picatinny Arsenal

Acid-resistant uniforms, made of 100% Dynel (synthetic fiber made by Union Carbide), have won the approval of Picatinny Arsenal's cleaning and plating operators. Prior to the introduction of the new uniforms, workers bought as many as four new uniforms a month. Now the Army issues them a freshly-laundered Dynel uniform every week.

Cleaning and plating operators are required to dip ammunition parts in caustic soda and acid baths before painting, aluminum anodizing, or zinc plating. Accidentally-splashed acid not only used to take its toll of clothing, but also caused acid burns since the acid ate right through the uniforms. With the new shirts and pants plus the protection of heavy rubber gloves, canvas aprons, boots, and goggles, a case of acid burn is rare. To make certain the new material would hold up, swatches of fabric were tested in the Arsenal's acid solutions before purchases were made.



Acid burns are rare now that workers have new uniforms

(Dynel uniforms were supplied by Worklon, Inc., Dept. CP, 253 West 28th Street, New York 1, New York . . . or for more information check CP 4116 on form opposite last page.)

Report covers 10 year gas research study

Results of 10 years of study of two of the fundamental reactions in the production of manufactured gas have been published. Studies of high-temperature (1700-2500°F) reactions between a solid fuel and oxidizing gases are presented as a) development of mathematical procedures for estimating physical and chemical factors associated with carbon gasification, and b) application of these procedures to the interpretation of steam and carbon dioxide decomposition rates and gas analyses.

To obtain Bul 19, "Reactions of Carbon with Carbon Dioxide and with Steam" remit \$7.50 direct to Institute of Gas Technology, Dept. CP, 17 West 34th St., Technology Center, Chicago 16, Ill. Specify CP 4117 opp. last page.

TRUFIN*

SAVES YOU MONEY

WAYS

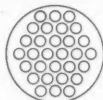
Anytime you cut down costs, you pep up the profit picture. Here's an idea: where heat exchange costs are concerned, Wolverine Trufin Type S/T—the integral finned condenser tube—can help you save money *eight* ways. Take a look at the points listed below. They can open the door to substantial savings, provide added dividends in increased efficiency.

✓ Because Trufin is an extended surface tube—with fins extruded right from the tube wall—it has more than twice the heat transfer surface of plain tube. Less tube is required because Trufin transfers more BTU's per foot of tube.

✓ Fewer tubes mean smaller shells, headers, baffles, etc. This saves material requirements.

✓ Fewer tubes mean fewer holes to drill—less rolling-in operations. Direct result: substantial savings in labor costs.

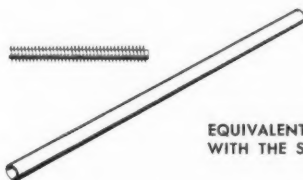
✓ To transfer a given heat load—when Trufin is used—much less weight of over-all tube metal is required. This is a real saving when expensive alloys are necessary. This is of greatest importance when alloys are in short supply, as a given quantity of metal in Trufin transfers much greater heat loads.



FEWER TUBES
MEAN SMALLER SHELLS

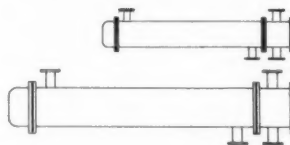
✓ Because of these material savings, lighter units—requiring less structural support—can be designed. This is vital when exchangers are to be mounted on superstructures.

✓ Maintenance costs are low. Costs of replacement tubes are reduced; fewer tubes result in less cleaning time, more "on stream" time. Actual operating data proves that Trufin withstands fouling for longer periods than does prime surface tube. This increases the length of operating time between change-overs.



EQUIVALENT TUBES
WITH THE SAME SURFACE

✓ Smaller, lighter units result in easier handling and lower shipping costs.



TRUFIN
MEANS
SMALLER
UNITS

✓ Where space is at a premium—as in revamped units—Trufin units are smaller.

There they are—eight job-proven ways in which Wolverine Trufin Type S/T condenser tube can save you money. Wolverine's Trufin Opportunity Book is filled with actual Trufin case histories, operating data, valuable design information. Write for your copy today. **WOLVERINE TUBE**, 1469 Central Avenue, Detroit 9, Michigan.

Wolverine Trufin available in Canada through the Unifin Tube Company, London, Ontario.



WOLVERINE TUBE
Division of Calumet & Hecla, Inc.

MANUFACTURERS OF QUALITY-CONTROLLED TUBING AND EXTRUDED ALUMINUM SHAPES

*REG. U. S. PAT. OFF.

4009

PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES

EXPORT DEPARTMENT, 13 EAST 40TH STREET, NEW YORK 16, NEW YORK

THE CASE OF THE BANTAM STAND-BY



"There was no doubt about it. Paul Jones was completely dumb-founded." "Just a minute," he screamed. "Do you mean to stand there and tell me that undersized little condenser is your stand-by unit? It's impossible. It's almost a third smaller than your on-stream units. It couldn't possibly carry the same heat load when you switch over."

"I couldn't help laughing to myself. Paul is a processing engineer—a good one, too. Home-office had sent him out to see just how come we were able to out-produce the east-coast plant. Basically, both installations are the same—but for the past year our production records have been away ahead of theirs. I had him out on an inspection trip—showing him our set-up."

"Paul", I said, "you'd make a good private eye. You spotted that size differential fast! Strange as it seems—that's the secret of our high production. It all started about the time this plant first went on stream. A Wolverine salesman was making a call just as I was going over the prints for our stand-by unit."

"Look," he said. "On this job, if you use Wolverine Trufin—the integral finned tube—you can design a smaller unit. Trufin is an extended surface tube with its fins extruded right from the tube wall. It has over twice the surface area of prime surface tube. As a result you get increased heat duty from a smaller unit plus a substantial saving in tubing costs."

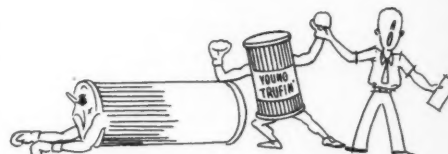
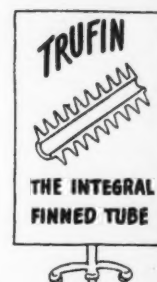
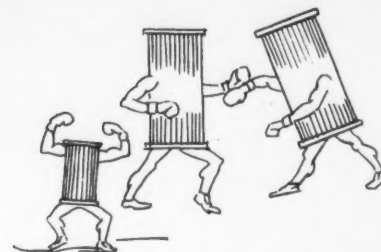
"Well, we designed the stand-by around Trufin Type S/T—and it worked just like he said it would. Naturally ever since then, when we pull a unit for retubing, we use nothing but Trufin Type S/T. That increased heat transfer surface is boosting our capacity—that's why our production has been ahead of yours."

And there you are! To achieve exactly the same kind of results in your own processing installation, specify Wolverine Trufin Type S/T. Write, too, for your copy of the Trufin Opportunity Book—64 pages—full of actual Trufin case histories and helpful design information.

WOLVERINE TUBE, 1469 Central Avenue, Detroit 9, Michigan.



PLANTS IN DETROIT, MICHIGAN, AND DECATUR, ALABAMA. SALES OFFICES IN PRINCIPAL CITIES
EXPORT DEPARTMENT, 13 EAST 40TH STREET, NEW YORK 16, NEW YORK

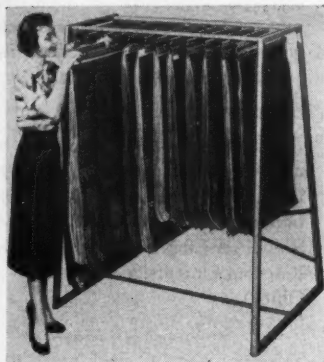


**Blueprints easily found
on storage rack . . .**

does away with all unnecessary
listing, fishing for prints

Newly designed blueprint rack does
away with listing and folding of
prints and fishing for drawings.
Capable of holding 12 to 18 sets
of drawings, rack measures five ft
high, four ft wide, and three ft
deep. If more space is needed, ex-
tension can be added.

Drawings are fastened to clamps.
Each clamp can hold up to 100
drawings. Clamps eliminate need
of punching holes in prints. Indi-
vidual drawings can be removed,



Clamps eliminate need for punch-
ing holes, can hold up to 100
sheets

without disturbing other sheets, by
simple thumbscrew adjustment.
Adjustable glider tracks on rack
allow for varying thicknesses of
sets.

("Glider" blueprint rack is prod-
uct of Momar Industries, Dept. CP,
4323 W. 32nd St., Chicago, Ill.
. . . or for more information check
CP 4118 on form which is located
opposite last page.)

For more information on prod-
uct at left, specify CP 4119
. . . see information request
blank opposite last page.

For more information on prod-
uct at right, specify CP 4120
. . . see information request
blank opposite last page.

It Costs You
A Minimum of
\$120⁰⁰* A YEAR
to Stock
\$1000⁰⁰ WORTH
of Industrial Supplies . . .
YOUR JOBBER
does it for You
FREE

* Minimum cost determined from survey made by "Industrial Distribution."

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	STORAGE FACILITIES
	INSURANCE AND TAXES
	FREIGHT AND CARTAGE
	HANDLING AND DISTRIBUTION
	DEPRECIATION AND OBSOLESCENCE
	INTEREST ON INVESTMENT

Stock carrying costs are worth the careful con-
sideration of every company in industry. The
figures here are the findings of INDUSTRIAL
DISTRIBUTION magazine from an analysis of plant
cost studies. But this saving is only one of nu-
merous advantages the industrial jobber offers
you. Others are: time-saving in delivery, ordering
convenience, technical assistance, etc.

**Your MIDWEST Jobber Can Save You Money
on Welding Fittings**



In addition to the savings indicated above, the
Midwest jobber offers you a substantial further
saving in Midwest "Long Tangent" Elbows. These
give you from 21% to 42% more elbow for the
same price and permit better piping design. Ask
our jobber for Catalog 54 to get all the facts.

7407

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STOCKING DISTRIBUTORS IN PRINCIPAL CITIES



Years of maintenance-free weatherproofing with jacketing of ALCOA ALUMINUM FOIL cost less than one good paint job



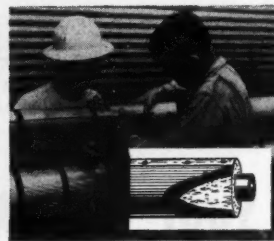
EASY TO CUT AND HANDLE. Four foot wide roll, corrugated for strength, can be cut to length by one man using knife and straight-edge.



TWO MEN CAN INSTALL JACKETING EASILY. No special shop work or roll forming needed. Pliers and wedge or screw driver are only tools required.



NO SPECIAL TOOLS NEEDED. Pliers pull aluminum strapping tight. Seals, strapping and jacketing are fully re-usable if line is moved or checked.



OTHER QUICK INSTALLATION METHODS include aluminum sheet metal screws or plastic tape. Aluminum jacketing will not rust, rot or dry out . . . provides lowest cost permanent metal jacketing system.

Now you can weatherproof and protect insulated lines, both outdoors and indoors, quickly, easily and economically—with jacketing of ALCOA Aluminum Foil. Just wrap it and forget it, because metallurgists estimate aluminum jacketing requires *no maintenance for as long as ten years* in many applications.

First costs and application costs are low, too—lower than even the cheapest weatherproofing when the cost of one paint job is considered. In fact, many users find aluminum foil jacketing costs no more—*frequently less*—than one good paint job!

You're always ahead with Alcoa . . . greatest name in aluminum

Jacketing of ALCOA Aluminum Foil is corrosion resistant, requires no painting, is available with or without moisture barrier attached. This corrugated aluminum covering can be used over any type of insulation.

ALCOA does not make aluminum foil jacketing, but we will gladly refer you to reputable manufacturers who do. Write to ALUMINUM COMPANY OF AMERICA, INDUSTRIAL FOIL DIVISION, 902-C Alcoa Building, Pittsburgh 19, Pennsylvania.



IDEAS

Terminology, nomenclature guidance wanted . . .

may aid Army Ordnance Corps in handbook preparation

Your hobby, preoccupation, or annoyance with terminology and nomenclature problems may be of help to Army Ordnance. The Corps is currently preparing an Ordnance Design Handbook and wants to make sure that there are no uncertainties as to the meanings of the words and nomenclature that will appear in it.

Since ordnance engineering cuts across many fields of science, there is a chance that your subject field might be of interest to them. They are also interested in formal or informal collections of terminologies, glossaries, specialized dictionaries, or references pertaining to them.

(Correspondence should be addressed to Allen Kent, Associate Director, Center for Documentation and Communication Research, School of Library Science, Western Reserve University, Cleveland 6, Ohio.)

Chemical company's success told in 55-page book

Facts and figures regarding story of the growth of synthetic organic chemical company in the Rocky Mountains, are presented in 55-page, cloth-covered, pocket-size book. Started in 1943 by five ex-students of the University of Colorado, book tells how company lifted itself to an established spot in the chemical field.

"Tough Enough to Grow" is issued by Arapahoe Chemicals, Inc., Dept. CP, 2800 Pearl Street, Boulder, Colorado. When inquiring specify CP 4121 on form opposite last page.

For more information on product at left, specify CP 4122 . . . see information request blank opposite last page.

CHEMICAL PROCESSING

Nuclear reactor efficiency may be upped to 32% . . .

experience gained with giant atomic power plant may boost operating pressures to 1800 psi

Experience gained with the world's largest atomic power plant may lead to reactors with higher thermal efficiencies. Operating pressures may be boosted from a planned 600 psi to 1800 psi — increasing efficiency from 26 to 32 percent. Operating temperatures would also be upped. Increases could result in reductions in size and cost of some of the reactor equipment.

The giant plant is presently under construction 47 miles southwest of Chicago, Illinois. Known as the Dresden plant, the 180,000-kw installation is located on a 950-acre plot of farmland where the Kankakee and Des Plaines rivers meet. Site was chosen because of adequate supply of cooling water and nearness of an existing transmission line. Total cost is expected to be over \$45 million when plant is completed in 1960.

Plant will have a dual-cycle boiling water reactor. This type permits boiling water directly in the reactor core, eliminating need for separate heat exchanger. Bechtel Corporation is engineer-Constructor for the overall project.

(Reactor is being designed by General Electric Company, Dept. CP, Schenectady 5, New York.)

Foreman's responsibility greater than his authority . . .

survey shows many are under pressure to get results, without having power to enforce decisions

Survey made of 66 companies in 10 states and Canada indicates that many firms expect more from their foremen than they are willing to let them do. This paradox results from a frequent failure to give the first-line supervisor authority commensurate with his responsibility. In consequence, many foremen are under pressure to get results without having the power to enforce their decisions.

More than 90 percent of the respondents said their supervisors were responsible for job training, answering employees' questions, and meeting periodically with immediate superiors to discuss problems. Yet the authority given to foremen in the whole area of human relations is surprisingly small.

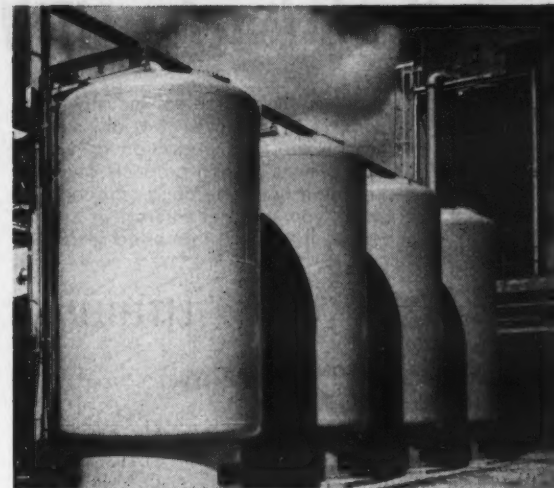
More than four-fifths of the companies expect foremen to discipline employees, but less than half permit them to demote or discharge for cause. In only a little over a third can foremen actually award merit increases.

Helping employees to work out their personal prob-

(Please turn to next page)



ENGINEERING. Permutit engineers work with your staff or your consulting engineers to design all or any part of your water conditioning system.



EQUIPMENT. Permutit supplies complete equipment. Critical parts such as valves, chemical feeders and controls are designed and made by Permutit.

How Permutit® Solves a Water Problem

U. S. industry is faced with using lower grade water. Results: possible boiler scale, turbine deposits, corrosion of pumps and piping . . . also stains, blisters and other problems in plating, rinsing, dyeing and chemical processing.

- **For expert answers,** more and more management men and their consultants are buying the complete service offered by leading water-conditioning firms. Here's how Permutit (rhymes with "compute it"), a pioneer and largest in the field, tackles a water problem:

- **Water analysis,** study of the problem and past experience provide data on possible methods of treatment. The process offering the best balance of initial and operating cost vs desired quality of treated water is selected.
- **Complete proposal** by Permutit engineers covers type, size and capacity of equipment, price, any special engineering services and performance guarantees.
- **Manufacturing** — After the proposal is accepted, Permutit designs the entire

project, schedules assembly and shipping. Critical parts, ion exchange resins, control panels are all made in Permutit plants. (No other U. S. firm makes all these components.)

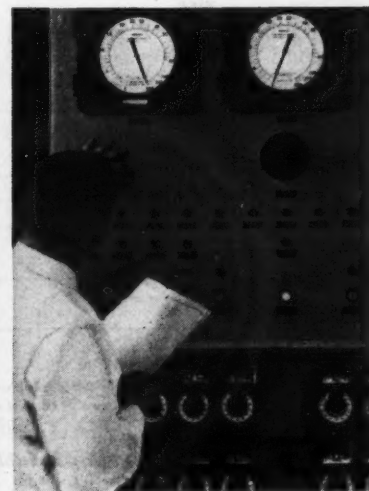
- **Test runs** — Where required, Permutit checks the installation, supervises start-up and initial operation, trains permanent operating personnel.
- **For further information** look up the Permutit office in your city or write to The Permutit Company, Dept. CP-3, 330 West 42nd St., New York 36, N. Y.



WATER ANALYSIS. Permutit's modern water-analysis laboratory tests over 1200 samples a month!



ION EXCHANGE RESINS. Permutit makes its own ion exchange resins, natural and synthetic zeolites.



AUTOMATIC CONTROLS to ensure optimum results are designed, assembled, wired and tested by Permutit.

When inquiring check CP 4123 opposite last page

X Check list for LITHIUM Researchers—No. 2

Lithium has enabled industry after industry to achieve over-all savings through shortcuts, reduction of waste, improvement of end-product, and simplification of operating procedures. Check your field of interest in Lithium below. If you are interested in a spe-

cific application relative to Lithium not indicated in the checklist, note the fact in the form furnished, attach it to your letterhead and send it to us. Our research laboratory will look into the matter for you.

LITHIUM COMPOUNDS

LITHIUM CARBONATE

Uses:

- ☐ Porcelain enamels
- ☐ Pottery glazes
- ☐ Special glasses
- ☐ Pharmaceutical chemicals.
- ☐ Lithium salts
- ☐ Heat treating salts

LITHIUM HYDROXIDE

Uses:

- ☐ Storage batteries
- ☐ Gas absorption
- ☐ Pharmaceutical chemicals
- ☐ Multi-purpose greases
- ☐ Lubricating oils
- ☐ Lithium salts

LITHIUM CHLORIDE

Uses:

- ☐ Gas absorption
- ☐ Air conditioning
- ☐ Welding rods
- ☐ Brazing fluxes
- ☐ Lithium metal
- ☐ Heat treating salts
- ☐ Deicer fluid

LITHIUM COBALTITE

Uses:

- ☐ Porcelain enamels (ground coats and colored cover coats)

LITHIUM BROMIDE

Uses:

- ☐ Air Conditioning
- ☐ Pharmaceuticals
- ☐ Gas absorption

LITHIUM NITRATE

Uses:

- ☐ Refrigeration
- ☐ Heat treating salts

LITHIUM MANGANITE

Uses:

- ☐ Porcelain enamels (ground coats for kitchenware, refrigerators, stoves, etc., cover coats for colored ware)
- ☐ Semi-conductors

LITHIUM SILICATE

Uses:

- ☐ Titanium porcelain enamels
- ☐ Glazes for sanitary ware
- ☐ Pottery glazes

LITHIUM TITANATE

Uses:

- ☐ Titanium porcelain enamels
- ☐ Ceramic glazes
- ☐ Electric porcelain

LITHIUM ZIRCONATE

Uses:

- ☐ Porcelain enamel ground coats
- ☐ Titanium porcelain enamel cover coats
- ☐ Ceramic glazes
- ☐ Electric porcelain

LITHIUM ZIRCONIUM SILICATE

Uses:

- ☐ Ceramic glazes
- ☐ Electric porcelain

LITHIUM ALUMINATE

Uses:

- ☐ Flux in highly refractory enamels

LITHIUM (META)BORATE

Uses:

- ☐ As a flux in enamel cover coats

LITHIUM MOLYBDATE

Uses:

- ☐ As smelter or mill addition in white enamel cover

I am interested in Lithium _____ for
(Compound, Metal or Derivative)

the following application: _____

Technical Data Sheets are available for every compound in the checklist. They will be sent as checked above.

... trends ahead in industrial applications for Lithium



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OF AMERICA, INC.**

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MINES: Keystone, Custer, Hill City, South Dakota • Bessemer City, North Carolina • Cat Lake, Manitoba • Ames Area, Quebec • BRANCH SALES OFFICES: New York
Pittsburgh • Chicago • CHEMICAL PLANTS: St. Louis Park, Minnesota • Bessemer City, North Carolina • RESEARCH LABORATORY: St. Louis Park, Minnesota

When inquiring check CP 4124 opposite last page

IDEAS

(Continued from preceding page)

lems was listed as a duty of foremen by almost all the companies surveyed. Yet allowing extra time off is just about all the foreman can do for the employee in most of the responding firms. Only about half permit him to adjust vacations within the company's vacation schedule, and even fewer give him the right to transfer employees within the department or grant leaves of absence.

Almost all the firms cited work planning as a key supervisory responsibility, yet most planning is conducted on higher levels. Keeping costs down, reducing waste, and staying within budgets are major problems for foremen, but less than a seventh ask them to keep cost records and prepare cost estimates.

In 90 percent of the companies surveyed, foremen are responsible for enforcing safety measures, but only in about three-fourths do they have the authority to do so. Only about a fifth of the firms let the foremen participate in the planning of safety programs.

Principal exception to the rule of responsibility without authority is the handling of employee grievances. The same number of companies (about three-fourths) expect foremen to hear grievances as grant them the power to settle those grievances at the first stage.

(Study was conducted by the Supervisory Development Service, American Management Association, Dept. CP, 330 West 42nd Street, New York 36, New York.)

Punched card, microfilm technique simplifies filing, processing of drawings . . .

large documents easily stored, speedily located
by automatic machine

Methods specialists estimate that it may cost a company almost \$15 to look up, reproduce, and refile a single engineering drawing or blueprint. Hidden costs such as these — plus the time losses involved — have pushed the development of a mechanized system of handling and controlling engineering drawings, plans, and related documents.

Heart of the technique is the punched aperture card. Microfilmed facsimile copies of drawings, mounted in transparent apertures of the cards, are indexed and fully identified so they can be processed quickly and at a fraction of present costs. Automatic machine speedily locates the drawing copy negative when it is needed. Film grains and processes have been perfected to provide detailed reproduction of drawings for only a few cents. Viewing equipment is available which projects the microfilmed image for easy reading.

Shipping and storage problems are reduced, too. Where formerly it required one freight transport plane, or possibly two, to rush 35,000 bulky draw-



Viewer projects microfilmed drawing to 24x36"

ings to a plane manufacturer or to the engineering maintenance section at an air force base, copies of the same drawings can be packed in a 1 x 1 x 1/2" box.

(Filmsort aperture cards are product of Filmsort Division of Dexter Folder Company, Dept. CP, 50 South Pearl Street, Pearl River, New York . . . or check CP 4125 opposite last page.)

Process recovers cesium 137 from nuclear wastes . . .

ferrocyanides act as "scavengers"; cesium losses are less than 1 percent

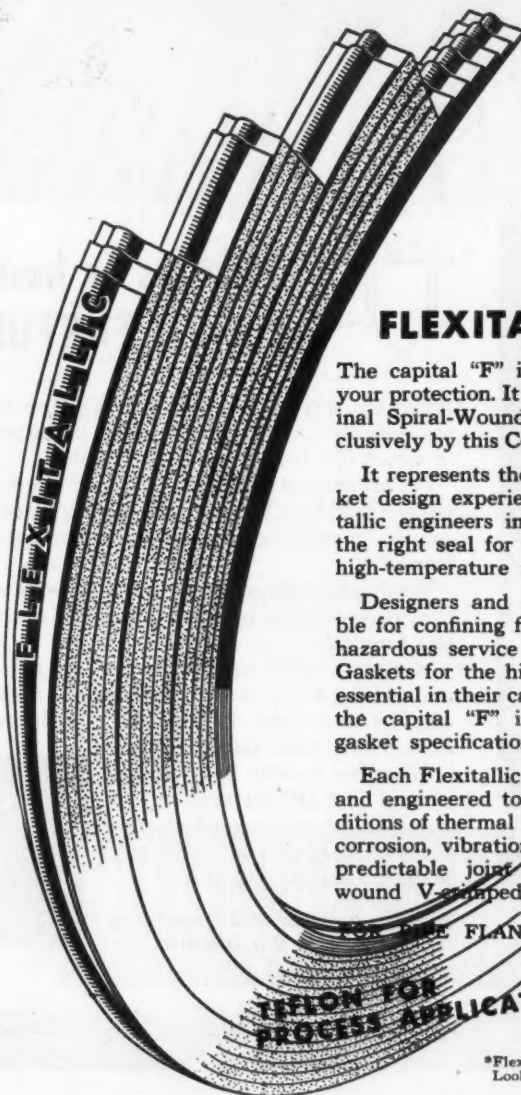
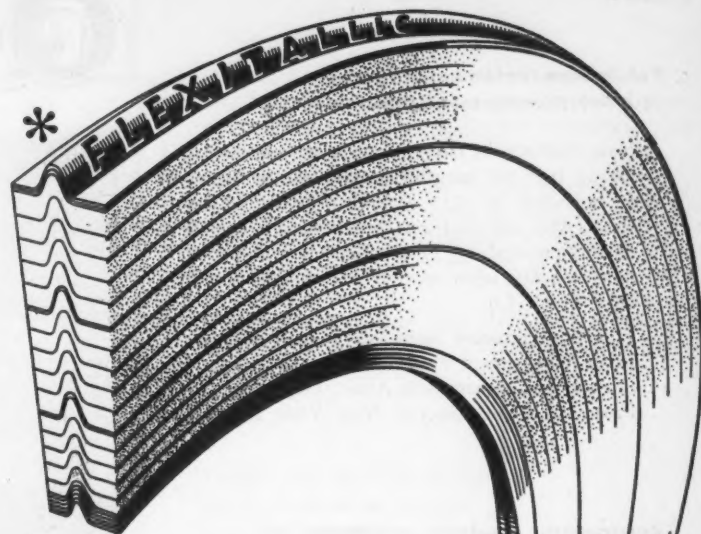
Large quantities of cesium 137 can be recovered from nuclear waste solutions by a new chemical separation process. Tests have shown that either nickel or ferric ferrocyanides can be successfully used as cesium "scavengers". By providing proper time and temperature conditions, it is possible to recover cesium from many wastes, with losses of less than 1 percent.

Prior to the development of the process, the high solubility of cesium compounds in water and the large quantities of other metals in the waste products made direct chemical separation of cesium difficult, expensive, and sometimes impossible.

The scavenging step was carried out in a laboratory under radiation conditions 10 times as intense as would be experienced in the actual recovery process. This was done to see if the process would operate as satisfactorily as it did under radiation-free conditions.

Results were successful. They were confirmed by actually scavenging "hot" plant wastes on a laboratory scale. No radiation difficulties are anticipated in full-scale recovery plant.

(Based on report sponsored by ACS and presented at the Nuclear Engineering and Science Congress, Cleveland, Ohio, by Dr. Warren H. Burgus and Dr. H. W. Miller, Phillips Petroleum Company, Dept. CP, Idaho Falls, Idaho.)



FLEXITALLIC WITH A CAPITAL "F"

The capital "F" in Flexitallic is for your protection. It designates the original Spiral-Wound Gasket made exclusively by this Company since 1912.

It represents the storehouse of gasket design experience used by Flexitallic engineers in providing exactly the right seal for your high-pressure, high-temperature sealing problem.

Designers and engineers responsible for confining fluids in extreme or hazardous service look to Flexitallic Gaskets for the high safety factor so essential in their calculations. It's why the capital "F" is so important in gasket specifications.

Each Flexitallic Gasket is designed and engineered to meet specific conditions of thermal and physical shock, corrosion, vibration, weaving and unpredictable joint stresses. Spirally-wound V-shaped plies of required

metal with alternating plies of proper filler result in a resilient gasket having characteristics of a calibrated spring.

Flexitallic Gaskets are at highest efficiency when bolted up cold at a predetermined load. For all pressure/temperature ranges from vacuum to 10,000 lbs., from extreme sub-zero to 2000°F. For all standard joint assemblies. In four thicknesses for special requirements: .125", .175", .250", .285".

FLEXITALLIC GASKET CO.
8th & Bailey Sts., Camden 1, N.J.

Representatives in principal cities

Flexitallic
SPIRAL-WOUND GASKETS

FOR PIPE FLANGES, PRESSURE VESSELS AND PROCESS EQUIPMENT

TEFLON FOR PROCESS APPLICATIONS

The ideal seal for many process applications is a Flexitallic Gasket with Teflon trapped between edges of stainless steel. Ask for folder, "Teflon in Flexitallic Gaskets."

*Flexitallic is a registered trade name. No one else can make a Flexitallic Gasket. Look for Flexitallic Blue—it's our exclusive blue-dyed Canadian asbestos filler.

When inquiring check CP 4126 opposite last page

**Publication reviews new frontiers
in labor-management relations**

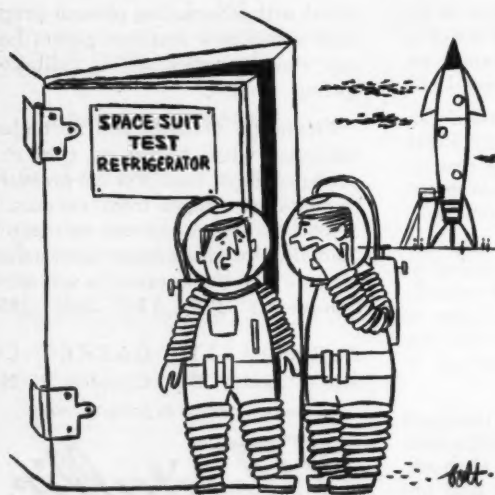
New frontiers in labor-management relations resulting from the bargaining tables of the big auto producers in 1955 are described in 48-page book. Also included are discussions on evaluating the practicability of supplementary unemployment benefits, labor relations at US Steel, and at Ford Motor Co.

To obtain Personnel Series No. 164, "Frontiers in Labor-Management Relations" remit \$1.75 direct to American Management Assoc., Dept. CP, 1515 Broadway, Times Square, New York 36, N.Y.

**Refrigerator produces, maintains
temperatures colder than those
in outer space . . .**

magnetic machine has no moving parts, uses 3" plastic capsule containing chemical salt

Based on a cyclic principle of magnetic cooling, a refrigerator has been developed that will maintain temperatures lower than those existing in the remote depths of outer space. Temperature produced in the machine — approximately 500 degrees colder than that of a conventional refrigerator — comes within a fraction of a degree of absolute zero (-459.6°F).



"Should be warm up there after that deep-freeze!"

The principle of magnetic cooling — the fact that certain materials will warm up when magnetized and cool when demagnetized — has been used for several years in a few cryogenic (low-temperature) laboratories for achieving extremely low temperatures. The magnetic refrigerator is said to be the first apparatus, however, that has been able both to

QO FURFURAL CHEMICALS

IN ALL THESE IMPORTANT USES

- ✓ SELECTIVE SOLVENTS
- ✓ CHEMICAL INTERMEDIATES
- ✓ EXTRACTIVE DISTILLATION
- ✓ RESIN FORMERS
- ✓ DYE DISPERSANTS
- ✓ PLASTICIZERS
- ✓ REACTIVE SOLVENTS

$$\begin{array}{c} \text{HC} \quad \text{CH} \\ \diagdown \quad \diagup \\ \text{C} \quad \text{C} \\ \diagup \quad \diagdown \\ \text{HC} \quad \text{C-CHO} \end{array}$$

Hawsers or hosiery via QO FURFURAL

Nylon hawsers, hosiery, lubricating oil, rosin, pharmaceuticals . . . These are just some of the products in which QO furfural proves its value.

For instance, over 40 petroleum refiners throughout the world use QO furfural as a highly selective solvent in refining lube oil and other petroleum fractions.

Resin manufacturers enjoy the benefits of long flow properties by modifying phenolic resins with QO furfural.

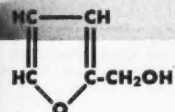
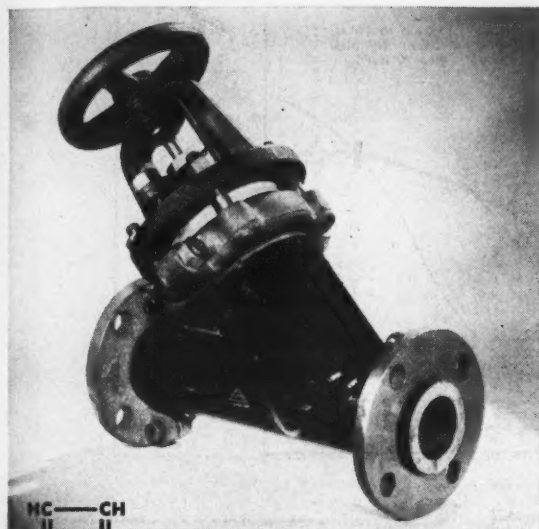
Abrasive wheel manufacturers use its solvent and wetting action in softening phenolic resin binders, and then react the furfural with the resin to form dense, super-hard wheels.

What has already been accomplished with QO furfural will be equaled or surpassed in the future. Keep posted with our helpful technical literature.

**Ask for Bulletin 204 describing
the use of QO furfural.**

Nylon marine hawser Photo Courtesy of Plymouth Company

PROVE THEIR VALUE...EVERY DAY



Corrosion-resistant valve is an example of the versatility of furfuryl alcohol resins. (Valve courtesy of Havg Corporation.)

QO FURFURYL ALCOHOL (FA®)

QO furfuryl alcohol is easily resinified when catalyzed by acidic reagents, and forms resins which are extremely resistant to attack by acids and solvents, and completely unaffected by alkalis—even hot concentrated solutions of NaOH.

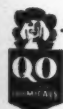
Versatile FA dissolves many resins and reacts with some types to produce useful modifications. It improves the gap filling and craze resistant properties of urea adhesives, wets mineral surfaces, disperses many difficultly soluble substances, and acts as an important chemical intermediate.

Now is the time for you to investigate the profitable possibilities of QO furfuryl alcohol.

FOR A
BROAD
SURVEY



BULLETIN 201-A provides a comprehensive outline of QO Furan Chemicals.



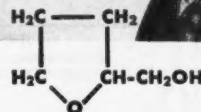
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When inquiring check CP 4127 opposite last page



Polyvinyl rainwear made flexible through use of THFA.

QO TETRAHYDROFURFURYL ALCOHOL (THFA®)

THFA is the starting point for many high-boiling esters and ethers. The 5-membered heterocyclic ring may be opened to form straight chain compounds, or expanded to a 6-membered ring, e.g., dihydropyran. Esterification proceeds smoothly with no special precautions.

Tetrahydrofurfuryl oleate is an important plasticizer, which contributes excellent low temperature flexibility to polyvinyl chloride films. It possesses excellent light and heat stability.

Brush and weed killers are formulated with tetrahydrofurfuryl esters of 2,4-dichlorophenoxyacetic acid (2,4-D) and 2,4,5-trichlorophenoxyacetic acid (2,4,5-T). These esters feature low volatility and ready solubility in organic solvents.

As a solvent, THFA has complete water miscibility and a high boiling point. It quickly dissolves a great number of resins, gums, dyes and complex organic compounds, saving time and money in the process.

THFA is indeed worthy of your immediate consideration.

IDEAS

produce and maintain these low temperatures for long periods of time. Previous equipment would begin to warm up as soon as the low temperature had been reached.

The magnetic unit has no moving parts or flowing fluids. It uses a plastic capsule 3" long, containing a chemical salt as the refrigerant. Operation of the refrigerator is controlled entirely by external magnetic fields.

(Magnetic refrigerator was developed by Arthur D. Little, Inc., Dept. CP, 30 Memorial Drive, Cambridge, Massachusetts.)

Tough, oil-resistant rubber made from scrap by new chemical process . . .

starting material may be natural or GR-S scrap

A durable, oil-resistant, low-cost synthetic rubber has been produced by a chemical process starting with rubber scrap. Four classes of the new rubber have been made, depending on the type of scrap used and the chemicals mixed with them. Products are said to be useful for making gaskets, oil and chemical-resistant rubber parts, sheeting and rubber-coated fabrics, shock absorbers, wire insulation, and other materials.

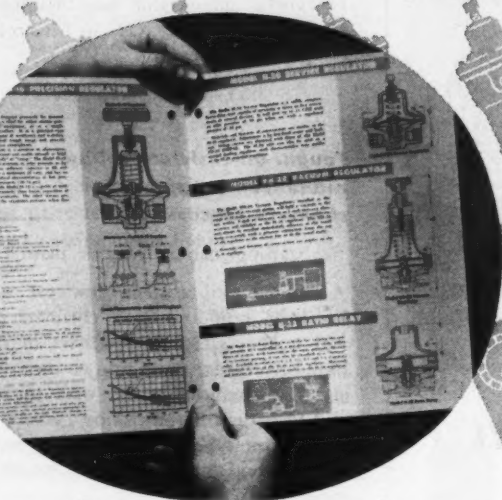
Process involves mixing the ground scrap rubber, reclaiming ingredients, and a solid acid (such as citric acid), in a Reclaimator at about 400°F. Time required is same as that used for conventional reclamation of rubber — about three minutes. Product is cooled immediately, rolled into sheets, and allowed to set at least 24 hr. In the laboratory experiments, as the concentration of the active chemicals was increased, the rubbery product gradually became tougher, finally reaching a point where it turned into a hard, brittle resin.

There seems to be little doubt that the new process, applied to scraps of truck and bus tires, forms a product far different from the conventional reclaimed rubber made from these materials. Although the starting material may be either natural or GR-S scrap, the products exhibit oil-resisting and aging properties normally associated with other types of synthetic rubbers. Degree of chemical cross-linking appears to be responsible for the oil resistance.

(Condensed from paper presented at fall meeting of ACS's Division of Rubber Chemistry, by Messrs. Joseph Green and E. F. Sverdrup, US Rubber Reclaiming Company, Inc., Dept. CP, Buffalo, N. Y.)

Easy-to-use nomograph on page 206 gives vapor pressures of sodium carbonate solutions

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Conoflow regulators are used to maintain a filtered and regulated supply to pneumatic instruments... on test stands... for a variety of applications on packaging machines... on remote manual control panels... for purging lines on differential manometers... in bleed systems... for manual to automatic by-pass service, etc., etc.

Write today for Bulletin H-2 illustrating and describing the Conoflow Series "H" regulator line. It's chock-full of cross section and dimension drawings — performance characteristics and applications. It will be mailed to you promptly, without obligation.

CC601

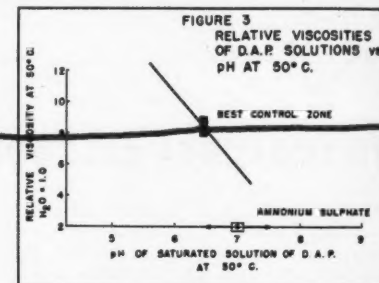
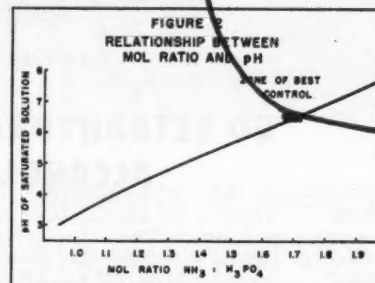
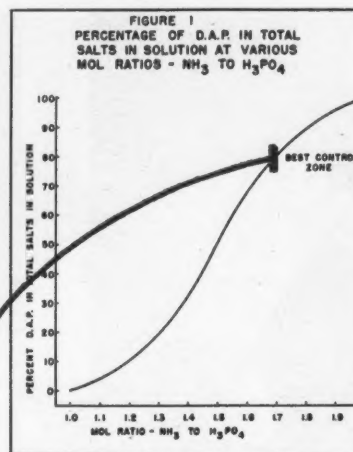
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Instrumentation & control



tracking down the control point

*How are optimum control settings
found for a new continuous process?*

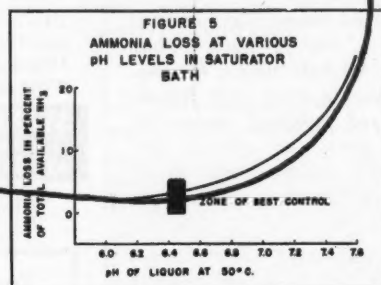
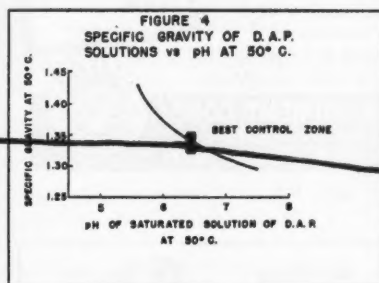
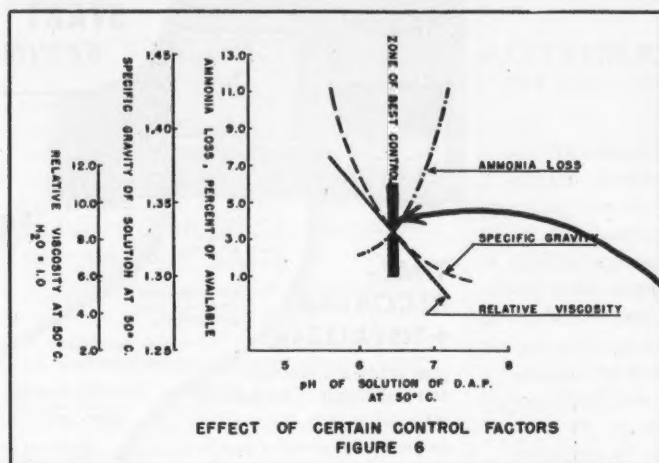
*This case study reveals what impor-
tant factors were found in continuous
production of diammonium phosphate*

...and how factors were pinned down

WITH a steady supply of ammonia available, Colorado Fuel and Iron Corporation was interested in producing diammonium phosphate (DAP) of fertilizer grade. Other firms had experimented in making DAP with coke by-product ammonia in laboratory equipment duplicating the continuous operation — and had no success. Process failure was laid to iron and aluminum impurities in phosphoric acid. "Wet process" phosphoric produced bulky gelatinous precipitates with ammonia; these interfered with formation of DAP crystals.

When electro-thermo phosphoric acid, without iron or aluminum impurities, became available in commercial quantities, continuous DAP process looked more attractive. The Colorado Fuel and Iron Corporation,

When inquiring check CP 4128 opposite last page



with technical assistance from Monsanto Chemical Company and Koppers Company, Inc., developed control methods and equipment changes to make commercial production possible.

First step in setting up a continuous process was to see what possible outcome would arise from various operating conditions. Ammonia and phosphoric acid can react in a number of ways. Mono-ammonium phosphate (MAP), DAP, tri-ammonium phosphate and a mixed salt $(\text{NH}_4)_3\text{PO}_4 \cdot (\text{NH}_4)_2\text{HPO}_4$ can form. Of these, only "mono" and "di" salts are stable.

Problem is to produce a maximum of DAP and a minimum of MAP. A 1:1 mol ratio of ammonia and phosphoric acid would tend to produce MAP. A 2:1 ratio would produce DAP. Fig 1 shows ratios of DAP and MAP produced for mol ratios between 1:1 and 2:1. Zone of best control was found between mol ratios of 1.68 and 1.7 where solution contains about 80% DAP and 20% MAP, but where any crystals formed would be 100% DAP.

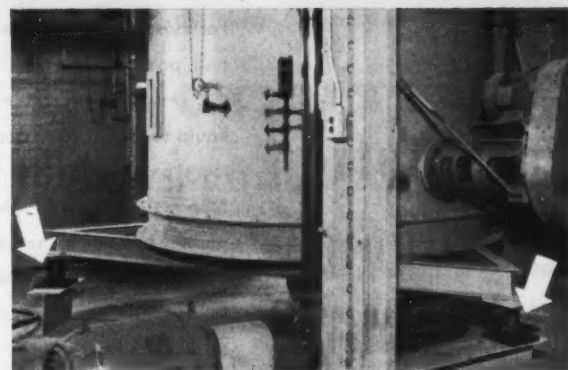
With supersaturation in 80-20 ratio, salt present as 80% (DAP) will crystallize with only minor contamination.

From this point it was reasoned that mol ratio could be easily followed by measuring pH of the mother-liquor. When mol ratio of ammonia to phosphoric acid is held within the range 1.68 to 1.70:1, pH is in the range 6.4 to 6.5. This is shown in Fig 2. Though an extremely narrow zone of operation, control within these limits was found to be fairly easy.

Narrow pH zone was selected because of several other factors. One of these is viscosity. As Fig 3 shows, relative viscosity increases as pH is lowered. At 5.6 pH solution has syrupy consistency. Because DAP crystals must be separated from the solution, a low viscosity helps. This tends to make the pH region around 7 attractive.

Specific gravity of the solution increases as pH is lowered — and at a more rapid rate than pH. This is shown in Fig 4. Here is

(Please turn to page 77)



Baldwin SR-4® system controls mixing to .1% repeatability

Here's how one processing plant mixes liquid sugar. A 2,500-gallon mixing tank and 10,000-gallon storage tank stand on triangular frames whose corners rest on Baldwin SR-4 load cells (top photo). These strain gage type cells measure tank weight changes and transmit electrical signals to a Baldwin indicator-controller. When predetermined proportions have been reached, sugar and water flow are shut off automatically by the indicator-controller.

Baldwin SR-4 systems can be developed for any application involving load, pressure, tension, torque or thrust. Custom-built systems range from simple weighing and measuring devices to complete feedback control. "Packaged" systems and component transducers are also available. For illustrated bulletins, write us at 806 Massachusetts Avenue, Cambridge, Massachusetts.



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For closer, automatic control over cake and pastry sweeteners, Fischer Baking Co. switched their Asbury Park plant to liquid sugar . . . with accurate measurement provided by this Neptune Auto-Stop meter. Every 15 minutes the baker pushes buttons to set the pounds required, and opens the valve. The meter follows through . . . shuts off automatically at the right pound. Big savings are reported in time and labor. No more carting, piling, scaling, and dumping of granulated sugar. It's neater, too, because the sugar stays inside pipes and tanks all the way.

Trouble-free operation 20,000 times a year at Fischer's plant is only one of many cases where Neptune meters have proved dependability and sustained accuracy in food plants.

INSTRUMENTATION

**Need only scissors
for assembling
PVC tubing . . .**

tight connection is made with hand assembly

Uses: Instrumentation fittings and tubing in pneumatic installations.

Features: PVC tubing and fittings are corrosion resistant and can be assembled without wrenches, flaring or bending tools, stretchers.

Description: Fittings and flexible tubing are made of unplasticized PVC. Fittings will hold burst pressures in excess of those to which tubing may be subjected. Maximum working pressure is 150 psi at 75°F.

Fittings and tubing are furnished in both 1/4" and 3/8" sizes. Fittings available are half unions, for joining plastic to male pipe thread; unions and bulkhead unions for joining plastic to plastic; connectors for joining plastic to female pipe thread. Caps are also available.

Fittings and tubing can be assembled with only a scissors or knife to cut the tubing to proper length. Connections are tightly made by hand.

(PVC fittings and tubing are products of Tube Turns Plastics, Inc., Dept. CP, 224 East Broadway, Louisville 1, Kentucky . . . or for more information check CP 4131 on form opposite last page.)

**Gives specifications
for pressure gages**

Printed in two colors, four-page bulletin pictures and specifies a wide range of pressure and vacuum gages. Range encompasses 0-15 to 0-20,000 psi, vacuum gages to 30" and combination gages from 30" to 300 psi. Flush and surface mounted units are pictured and described.

Bul 364 is issued by Norden-Ketay Corp., Dept. CP, Wiley Street, Milford, Conn. Specify CP 4132 opp. last page.

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Gives absolute time-study data per operation.

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LOW COST LIGHTING
for Gages, Rotameters, etc.**

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Gages and Valves
for the Observation
of Liquids and Levels

When inquiring check CP 4130 opposite last page

When inquiring check CP 4134 opposite last page

CHEMICAL PROCESSING

Optimum Control

(Continued from page 75)

another factor which tends to make the pH region around 7 attractive.

Practical limits for these two factors is the allowable ammonia loss as is shown in Fig 5. As pH is increased, ammonia loss increases, too. While it is possible that ammonia could be recovered in a secondary scrubber with acid of greater concentration, cost of installing such equipment can not always be justified in this process.

Amount and nature of solids present in the reactor at various levels of pH are shown in Fig 7. Up to a pH of 5.6, mono-salt predominates. This salt would be crystallized if bath became supersaturated. Above 5.6 di-salt prevails and would be crystallized.

Compromise between ammonia loss on one hand, against specific gravity and relative viscosity on the other, is chosen pH range of 6.4 to 6.5 as shown in Fig 6. Specific gravity in this control zone is 1.335 to 1.345 and operation here will hold ammonia loss to about three percent.

Routine pH determinations once-an-hour were set up as a control measure. Process operators were quickly trained to make the measurement. As a check, a continuous recording pH meter is also installed — though automatic pH control has been found impractical. For double control, specific gravity is also checked hourly. Gravity checks are helpful in detecting small changes which might be "covered" by buffering action of the liquor.

(Information for this article was taken from a report by John D. Price and Kenneth B. Stuart of The Colorado Fuel and Iron Corporation, Dept. CP, Pueblo and Denver, Colorado.)

Describes electronic controller for humidity

In two colors, eight-page bulletin describes electronic hygrometer humidity controller. Applications suggested include control of humidifiers, dehumidifiers, air conditioning, laboratory test rooms, process control.

Bul 2273 is issued by American Instrument Co., Inc., Dept. CP, 8030 Georgia Ave., Silver Spring, Maryland. Specify CP 4135 opposite last page.

This month's Processing and Engineering
Data section starts on page 200

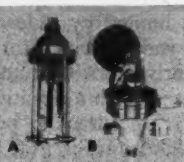
HERE'S HOW

BECKMAN pH CONTROL

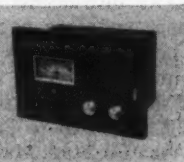
AUTOMATICALLY SERVES CHEMICAL PROCESSING

Beckman industrial pH equipment provides more than a means of lowering operating costs and stepping up efficiency — it can bring automation to whole phases of chemical processing. Fully automatic pH control saves wages and chemicals, reduces maintenance costs, eliminates grab sampling, and provides a continuous permanent operating record.

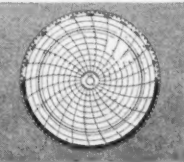
The Beckman Model W pH Meter is unaffected by water, humidity, corrosive gases, vibration, or electrostatic interference from motors, generators, etc. The name Beckman is your guarantee of dependable performance.

AUTOMATIC pH CONTROL REQUIRES ONLY THESE SIMPLE PARTS —**1 THE ELECTRODES**

These virtually unbreakable units require practically no maintenance. They can be mounted in Immersion Assemblies (A) in tanks or vats, and in Flow Assemblies (B) for pipe lines.

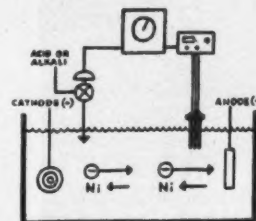
2 THE pH METER

Only one-quarter the size of conventional meters — its use of miniature and subminiature tubes and printed circuits has achieved this compactness without sacrifice of accuracy, durability, or reparability.

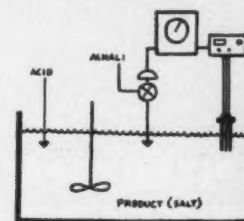
3 THE RECORDER

All leading makes of recording and controlling equipment can be used with the Model W Meter. The recorder can be mounted nearby or in a distant central control room.

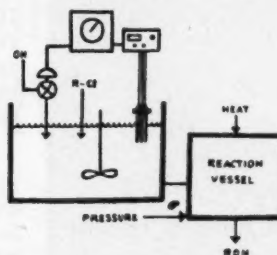
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copper refining
nickel refining
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chlorine



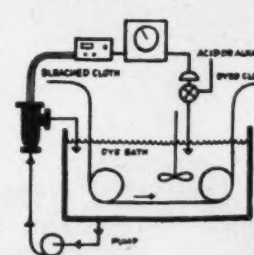
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calcium hypochlorite
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dextrin from starch
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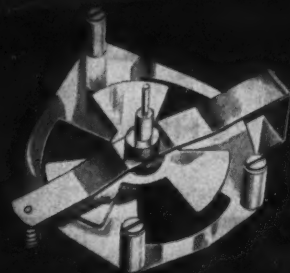
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M7-13

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STEPLESS CAPACITY-BALANCING PROVIDES SPEED WITHOUT WEAR!

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ELECTRONIC  INSTRUMENTS

When inquiring check CP 4137 opposite last page

INSTRUMENTATION & CONTROL

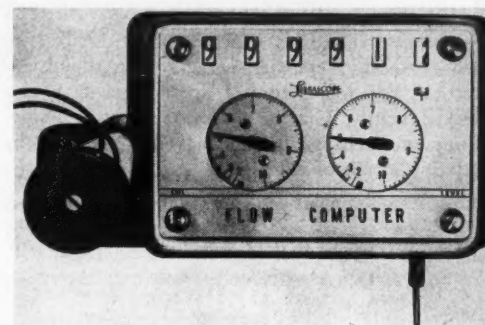
Continuous flow integration encompasses pressure and flow rate

Ball-and-disc integrating units produce accurate totals for gas flow

Uses: Accurate integrating and totalizing of gas flows where allowance is made for compressibility of gas.

Features: Static pressure and differential pressure across a flow sensing element are continuously integrated. Output of device is a series of pulses with pulse count directly proportional to quantity of gas delivered.

Description: Integrator continuously computes the extension factor in flow equation. This is the square root of the product of static and differential pressure. Result is totalized on a mechanical counter. This counter provides a switch closure for an electric pulse output.



Result of static and differential pressures is totalized on mechanical register

Flow computer is a mechanical device, clock-driven by electrical or pneumatic means. Unit can be installed in an instrument case of an existing orifice meter installation.

Mechanical circuit of computer consists of a clock motor driving a counter through a gear train and two double-disc integrators connected in series. Integrators act as speed changers by using amount of displacement of discs from zero position. Combined action of the linkage and discs generates square root of the input value.

Computing accuracy is within 1/2% of full scale output. Counter output is up to 18,000 counts per hour with electric motor drive, 100 counts per hour with pneumatic drive. Size of unit is 9 x 4 1/2 x 3/4".

(Flow computer is product of Librascope, Inc., Dept. CP, 808 Western Ave., Glendale, California . . . or check CP 4138 opposite last page.)

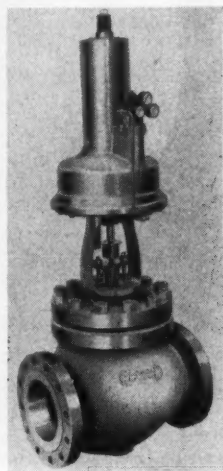
**Actuator can be inverted
to change valve action
while in use . . .**

compression of stem packing is not released and there is no interference with open yoke

Uses: As pneumatically-operated control valve which can be converted with standard parts into a "special" valve required by process conditions.

Features: Superstructure of valve can be inverted, without interfering with open yoke or releasing compression of stem packing, to reverse action. Air-to-open can be reversed to air-to-close action.

Description: Valve series of single seat construction has body design to provide an extra large bowl capacity for high coefficient of flow without involving excess body weight. Blind head is not required, since all internal parts are removable through valve bonnet, and since action may be reversed by inverting superstructure. Valves are offered in nominal sizes from 1/2 through 8". Plugs and valves two inches and larger are of balanced design and can be supplied with a special device for tight shut-off.



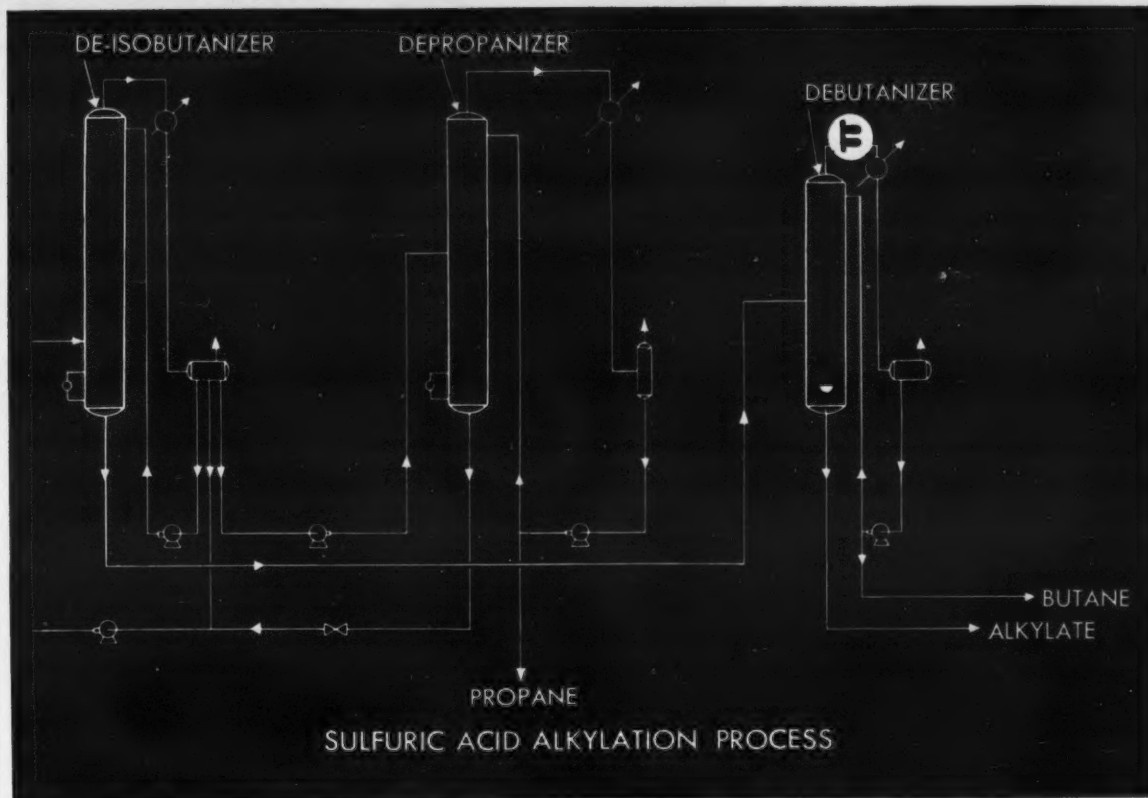
Diaphragm actuator inverts to change valve action

(Series S-3000 control valves are product of Hammel-Dahl Co., Dept. CP, 175 Post Road, Warwick Industrial Park, Providence 5, R. I. . . or for more information about manufacturer's product, reader may simply check CP 4139 on form opposite last page.)

**Case histories suggest uses
for systems engineering**

Booklet of 12 pages includes brief case histories of specific installations made by industrial systems engineering group. Case histories include problems on counting steel sheets, detection of pipeline interface, controlling papermill winding. Simplified block diagrams of installations are used to explain the problems involved.

"Industrial Systems Engineering" is issued by Berkeley Div., Beckman Instruments, Inc., Dept. CP, 2200 Wright Ave., Richmond 3, Calif. When inquiring specify CP 4140 on form opposite last page.



Cut isobutane loss in debutanizer overhead . . .

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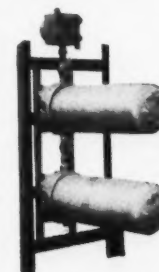
An analyzer sensitized to isobutane, at the debutanizer overhead, provides information to the operator with which he can control either the butylene-isobutane feed ratio, or deisobutanizer operating conditions. "Analytical lag" is eliminated by moving the laboratory right onto the process line.

P-E instruments can analyze and control to $\pm 1\%$. They need no special housing, require no compli-

cated automatic standardization. They provide the best zero and range stability available.

When you specify continuous analyzers for your process streams, only P-E has a complete line of instruments to choose from. Or let us develop a complete analytical control system for you. Nowhere else can you get the combination of chemical engineering and instrument know-how that you'll find at P-E.

*T. M.



P-E TRI-NON Analyzers are available in a wide range of models and prices to meet all types of continuous analytical problems. They are rugged and dependable, expressly designed for use in the varied environments of a processing plant or refinery. For quick and easy maintenance, instrument components can be tested right on stream — without disconnecting.

Perkin-Elmer

CORPORATION
Norwalk, Connecticut

When inquiring check CP 4141 opposite last page

INSTRUMENTATION

One millivolt full scale is lowest range of VTVM...

AC scales run from 0.001 to 300v, response 10 cps to 2 mc

Uses: Provides accurate readings of small AC voltages. Ranges are 0-0.001/0.003/0.01/0.03/0.1/0.3/1.0/3.0/10/30/100/300 volts full scale.

Features: For a frequency response from 10 cps to 1 mc, accuracy is $\pm 3\%$ for 10 cps to 2 mc, $\pm 5\%$.

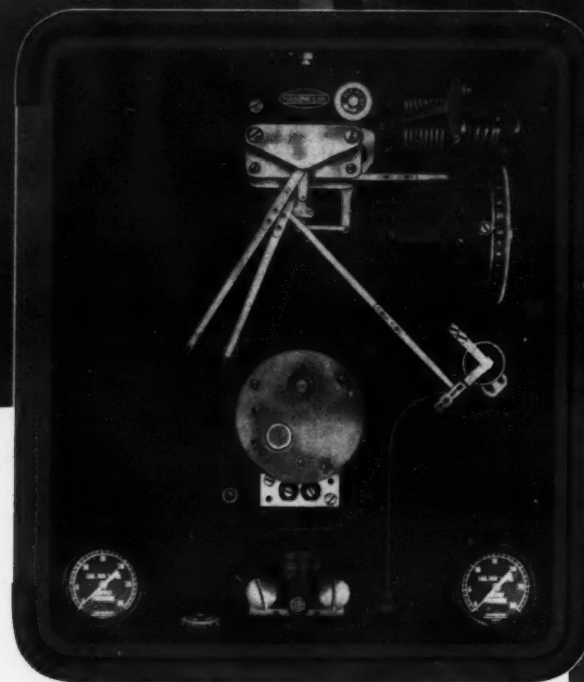


Vacuum tube voltmeter is 6½" high

Description: Compact vacuum tube voltmeter uses illuminated 4¼-inch meter scale. Linear voltage scales of 0-1 and 0-3 apply from microvolt to hundreds of volts range. Full-wave rectification is used for accuracy in dealing with complex wave forms. Components are accessible for servicing, tube replacements are non-critical, filter capacitors plug-in.

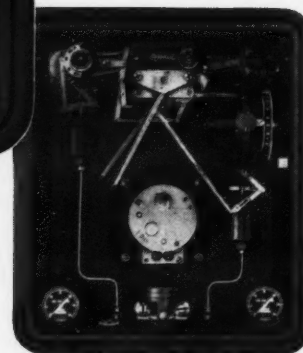
Input impedance of meter is 10 megohms shunted by 24 μf . Maximum voltage gain of amplifier is 1000 with a maximum output voltage of 1 volt. Output impedance is 600 ohms, hum and noise 40 db below 1 volt when amplifier is used as such.

Meter movement cannot be damaged by overload. Meter stands 6½" high, weighs 6½ lb. It is supplied by 105 to 130v AC,

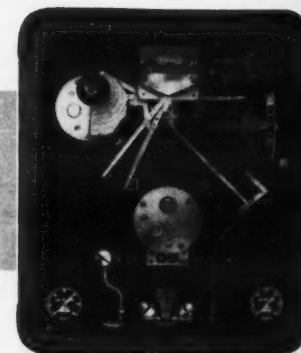


BASIC 60000 PNEUMATIC CONTROLLER

The basic controller provides versatility by combining proportional, differential-gap and on-off control, each with reversible action, in one instrument. Subassemblies may be installed to add the functions of reset and derivative. The exclusive gimbal unit enables you to select type of control and action and to adjust proportional band with one simple setting of the proportional band wheel. Large knurled knobs facilitate adjusting set point, reset rate and derivative time. All settings are made without disturbing the chart.



These are the functions you can perform. Pneumatic Set may be added to provide pneumatic positioning of the set point. Remote operation uses output pressure from another controller, a transmitter or a manually adjusted loading regulator.



Time Schedule may be added to position set point in accordance with a process-time schedule. Cam operation and chart record are in same instrument. Separate cam drive permits recording two or more cycles during one chart rotation.

THE VERSATILE 60000

ADVANCED LINE OF MASONEILAN CONTROLLERS

Complete series of pneumatic controllers features accuracy, dependability and simplicity — low over-all cost.

The answer to measuring or controlling your process can very likely be found in these Masoneilan Controllers. Many different func-

tions can be performed, separately or in combination, using this advanced 60000 series. The features and flexibility are noteworthy:

- Unit subassemblies for independent servicing or interchange.
- Gimbal unit provides four combinations of primary and feedback motion.
- All air passages manifolded — with plug in connections for all pneumatic units.
- Modern design, tailored appearance — easy to mount and to service; recording or indicating types.

Select the right combination for your process control from the variety of models shown here. Then, plan to standardize on this advanced line — it will save you money on over-all instrument investment and pay-off

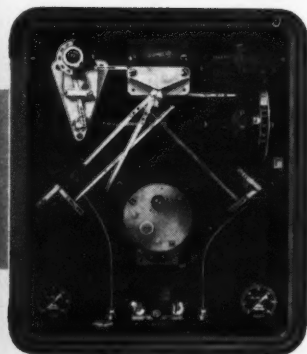
in dependable performance. Contact the Masoneilan representative nearest you, or write:

Mason-Neilan Regulator Co., 1203 Adams St., Boston 24, Mass.

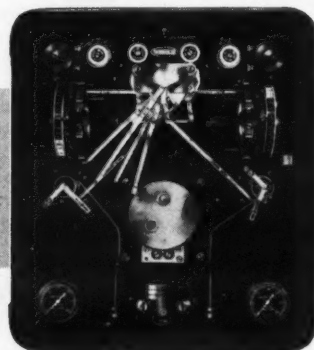
MASON-NEILAN



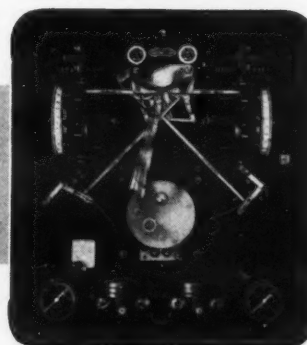
Sales Offices or Distributors in the Following Cities: New York • Syracuse • Chicago • St. Louis • Tulsa • Philadelphia • Houston • Pittsburgh • Atlanta • Cleveland • Cincinnati • Detroit • San Francisco • Boise • Louisville • Salt Lake City • El Paso • Albuquerque • Odessa • Charlotte • Los Angeles • Corpus Christi • Denver • Appleton • Birmingham • New Orleans • Dallas • Seattle • Mason-Neilan Regulator Co., Ltd., Montreal and Toronto



Differential mechanism is added to position set point by one of two similar variables between which a differential is being maintained by controller; or by one of two dissimilar variables between which the controller is maintaining a relationship.



The Dual Selector Controller consists of two complete control mechanisms which actuate a common pilot interchangeably, according to process requirements. It is used where two related variables may be controlled by a single valve.



Dual Controller has two complete units, including primary elements, in one case. Controls two similar or dissimilar variables and either or both may be recording or indicating. Duplex Controller has two mechanisms but one primary element. May be two controllers or controller and transmitter.

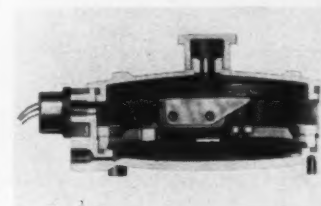
50-400 cps and draws 40 watts.

(Type 346 Vacuum Tube Voltmeter is a development of Technical Products Div., Allen B. Du Mont Laboratories, Inc., Dept. CP, 760 Bloomfield Ave., Clifton, N. J. Check CP 4142 on form opposite last page.)

Senses and actuates on differentials of 0.5" water

Uses: Actuating electrical circuit according to an increase or decrease of predetermined pressure difference.

Features: Switch is not sensitive to jarring or vibration and will operate in any position.



Pressure difference operates SPDT snap-action switch

Description: Diaphragm pressure switch senses pressure difference from 0 to 45" water between variable and reference pressure. Actuation value is 0.5" water. Reference must be air or inert gas. Variable pressure may be liquid or gas. Switch is readily adjusted by external screw.

Switch incorporates a UL-approved SPDT snap-action switching element rated for AC and DC. Splash-proof housing protects entire mechanism from dust or damage in exposed installations.

(Switch 227 is product of Barksdale Valves, Dept. CP, 5125 Alcoa Ave., Los Angeles 58, Calif. Check CP 4143 opposite last page.)



For more information on product at left, specify CP 4144. See information request blank opposite last page.

NEW! TOP READING AUTOMATIC TANK GAUGE

"Varec"

FIG. **2500 R** SERIES

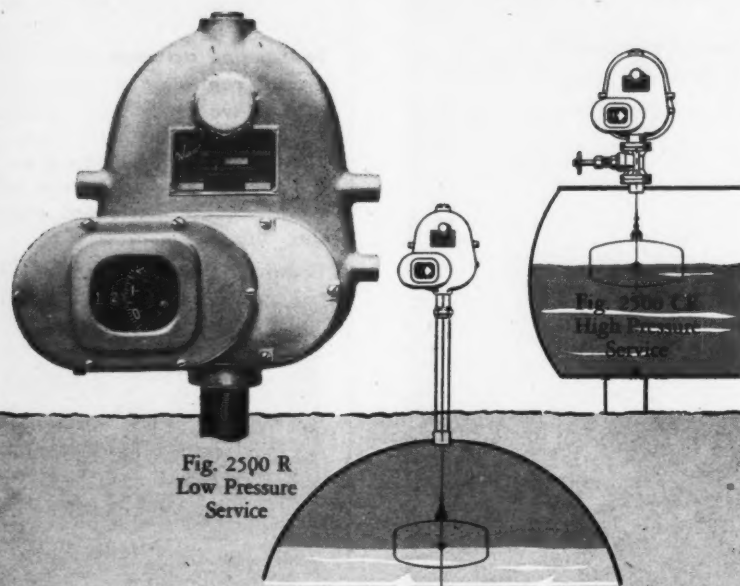


Fig. 2500 R
Low Pressure
Service

Introducing a special adaption of the Figure No. 2500 series, designed for use on all tanks, below or above ground, where top readings are required. Elbow sheaves and brackets are eliminated on this model. The stainless steel tape is connected from the gauge head to float in a straight line. Elimination of extra parts reduces friction; therefore, greater accuracy can be expected.

Figure No. 2500 R is float and Neg'ator motor actuated, has the combination counter and dial reading, gravity compensator, and built-in operation checker. Can be mounted directly on tank or at eye level at customer's option. Furnished for working pressures to 2.5 p.s.i.g. as standard.

For higher working pressures to 300 p.s.i.g., the Figure No. 2500 CR is recommended. Its counter mechanism is magnetic driven, no packing glands or mechanical seals required on the rotating shaft. Convenient provision is made for mounting remote gauger transmitters, and high or low level limit switches for sounding alarms, lighting lights, starting and stopping pumps, etc.

Contact your "Varec" representative or write the factory for full information.

"Varec"

THE VAPOR RECOVERY SYSTEMS CO.
COMPTON, CALIFORNIA, U. S. A.

Cable Address: VAREC COMPTON
(Cal. U.S.A.) All Codes

INSTRUMENTATION

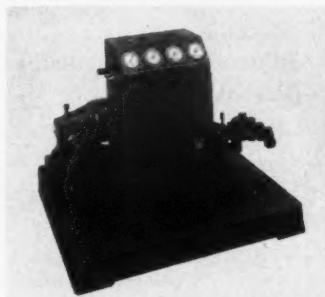
Uses 3-15 psi signal
to adjust capacity
within 1% . . .

controlled volume pump uses
air servo with feedback loop

Uses: Pump is designed for
specific low capacity flow control
problems.

Features: Change in instru-
ment control air pressure of as
little as 1/70 psi causes re-setting
of pump stroke length.

Description: Controlled vol-
ume pump has adjustable instru-
ment air stroke-length for pneu-
matic process control systems.
Reversible rotary air motor ad-
justs stroke length from zero to
100% of full length. Motor and
other components of the pneu-
matic servo system are housed in



Stroke length adjusts according
to air pressure

22" high cabinet mounted on
pump base. Four gages show key
air pressures. Actual stroke length
is indicated by dial mounted on
pump.

(Adjustable stroke length pump is
product of Milton Roy Company,
Dept. CP, Station N, 1300 E.
Mermaid Lane, Philadelphia 18,
Penna. . . or for more informa-
tion check CP 4147 on form oppo-
site last page.)

Instruments needed?

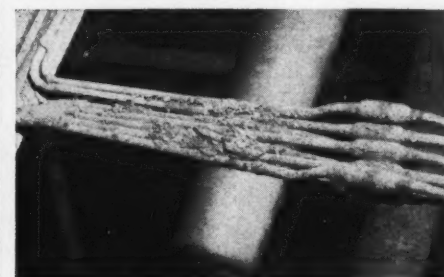
Check the convenient product
directory which starts on page
213 in this issue

Dekoron[®]
PLASTIC ARMORED METAL

**cuts instrument
tubing costs
2 ways...**

FIRST—Dekoron tubing costs less than
expensive alloy instrument tubing.

SECOND—Dekoron outlasts every
other type tubing which Samuel
Moore & Company has studied . . . has
outlasted every kind of tubing which
customers have reported trying.



Dekoron tubing still in good condition
after 2½ years' exposure to deposits high in
hydrochloric acid. Copper was destroyed
in 18 months.

Dekoron tubing is not metal only, not
plastic only—it combines the advantages
of both materials. Dekoron has a thick,
corrosion-resistant coating of polyethylene
or vinyl plastic tightly extruded over
copper or aluminum. Or for special instal-
lations, steel can be used.

Lengths of Dekoron tubing are joined
with standard fittings covered with plastic
tape to make the complete installation
impervious to corrosive fumes from acids
and alkalis, moisture, salt air, oils and
grease. No expensive painting or other
maintenance is required.

If you have a corrosion problem, write
for Bulletin L-6506 "3 Ways to Whip
Corrosion and High Tubing Installation
Costs in Your Plant."

AA-981

Dekoron tubing

SAMUEL MOORE & COMPANY
Dekoron Products Division
MANTUA, OHIO

When inquiring check CP 4146 opposite last page

When inquiring check CP 4148 opposite last page

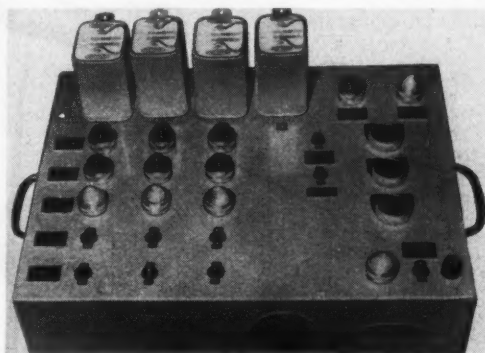
CHEMICAL PROCESSING

**Allows "on location" testing
of plug-in components
for alarm system . . .**

all changes of internal circuitry are made by means of a single rotary switch

Uses: Checking performance of plug-in relays and flashers employed in manufacturer's annunciator systems.

Features: Plug-in tester is portable and allows testing of manufacturer's equipment at point of installation. Tester adapts to system being tested by single rotary switch to change internal circuitry.



Correct performance of relays and flashers is indicated by lamp pattern on tester

Description: Portable testing device checks operation of manufacturer's standard 59 series relays and flashers. Relays and flashers are simply plugged in and appropriate voltage is applied. Correct performance of all functions is indicated by lamp pattern displayed on tester under its several switch settings. Tester is equipped with carrying handles and plug-in power cord. Aluminum case measures 13 x 17 x 4 inches and is finished in green hamertone. Unit weighs approximately 12 lb.

(Panalarm plug-in tester is product of Panellit, Inc., Dept. CP, 7401 N. Hamlin Ave., Skokie, Ill. . . or check CP 4149 opposite last page.)

**Buyer's guide to replace
pH equipment**

Four-page illustrated guide shows components of manufacturer's pH meters that have been replaced since 1937 by other units. Guide shows how to match components such as meters, flow or immersion assemblies, electrodes, manual or automatic electrode switches.

Spec Sheet 425 is issued by Beckman Div., Beckman Instruments, Inc., Dept. CP, Fullerton, Calif. Specify CP 4150 opposite last page.

WHAT'S NEW AT BRISTOL...



NEW BRISTOL 500W Air-Operated Controller offers proportional band to 400% and reset-plus-derivative control.

New Bristol 500W Air-Operated Controller offers proportional band-width up to 400%

The new 500W Controller, latest addition to Bristol's 500 Series of Air-Operated Controllers, offers better control of difficult processes than ever before. The 500W features:

- 1. Wider proportional band** allows control of difficult processes without cycling or instability. Choice of two band-width ranges from 1% - 200% or 2% - 400% of chart width, adjustable by user. Choice can be made by the user - no extra parts, no special tools, no calibration required.
- 2. Increased stability**, without loss of sensitivity, for smoother control. New internal stabilizing elements insure freedom from short-period oscillations.
- 3. Wider reset response** range to eliminate offset or drop errors in control. Standard reset rate of 0.1 to

10 repeats per minute or fast reset rate of 1 to 300 repeats per minute are available.

- 4. Increased derivative range**, for better response to changing variables. Derivative time adjustable from 0.2 to 20 minutes. Bristol's exclusive zero derivative setting facilitates adjustment of controller to process.

- 5. Fixed links and levers** give built-in calibration for greater accuracy, no misadjustment, low maintenance.

You'll find Bristol's widened line of Series 500 Air-Operated Controllers more than ever adaptable to your control problem - whether for controlling pressures, liquid-level, flow, temperature, motion, speed, pH, electrical values, or other variables. Why not get all the facts on these instruments? Write The Bristol Company, 141 Bristol Road, Waterbury 20, Conn. 5.35

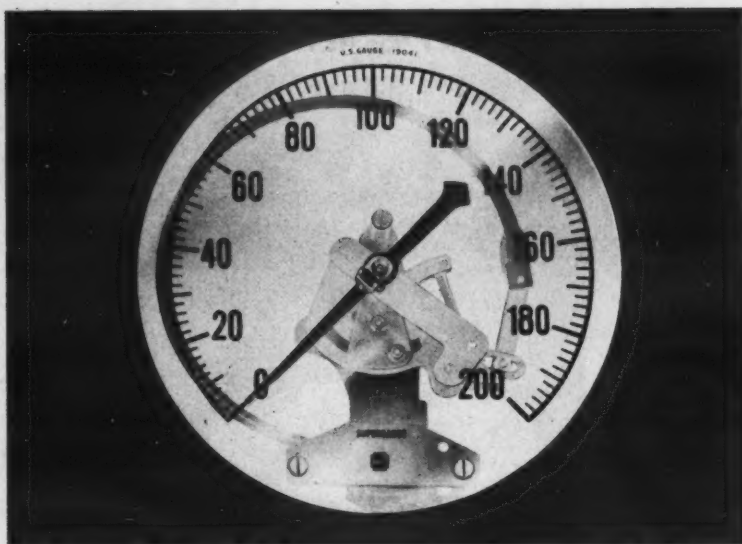
BRISTOL'S
TRADE MARK
REG. U.S. PAT. OFFICE

BRISTOL

**POINTS THE WAY IN
HUMAN-ENGINEERED INSTRUMENTATION**

AUTOMATIC CONTROLLING, RECORDING AND TELEMETERING INSTRUMENTS

When inquiring check CP 4151 opposite last page



New Supergauge Movement Extends Gauge Life; Gives Users Many Extra Benefits

In the quest for longer gauge life under severe operating conditions, one of the principal hurdles confronting instrument engineers has been the problem of gear tooth wear. Many efforts have been made to solve this problem including the use of materials other than metal.

U. S. Gauge research indicated nylon rolling on stainless steel provided the best solution if proper control of the nylon were achieved. All past experience showed that expansion of the nylon when subjected to heat and humidity changed pitch diameter causing binding and wear. This destroyed the gear rolling action, thus defeating its main advantage of assuring longer gauge life under severe operating conditions.

Using a new approach to the problem, U. S. Gauge engineers developed the new *ARC-LOC movement.

Molded nylon is bonded to the face of the stainless steel segment to maintain pitch diameter. Gear teeth are then accurately generated on the nylon face to assure perfect rolling action on the stainless steel pinion. The segment gear face is broad and all bushings or pivots are deep to assure strength and ruggedness. The result is longer gauge life under severe operating conditions.

Since nylon is applied to the arc of the sector, any tendency of the nylon to grow or shrink occurs along the periphery instead of along the radius. Thus, accurate pitch diameter is maintained and there is no wear from binding. With this design, the smooth gear rolling action between segment and pinion continues even under adverse conditions of heat and humidity.

The new U. S. Gauge ARC-LOC movement also provides several additional features of interest to the user: For easier adjustment the complete movement can be rotated about the pinion axis, positioned properly and locked from the rear. This provides the advantage of linearity adjustment without removing dial and pointer. The unique locking method also eliminates creep during locking.

The Arc-tang segment allows range adjustment without resetting of the pointer.

These added advantages mean savings in time during calibration... an important factor in maintenance reduction.

For complete information on the savings that are made possible by U. S. Gauge's new Supergauges and Solfrunt gauges with the new ARC-LOC movement, write for Publication 1819.

*Trademark

Gauge Headquarters

FOR OVER 50 YEARS

UNITED STATES GAUGE

UNITED STATES GAUGE

Division of American Machine and Metals, Inc., 103 Clymer Avenue, Sellersville, Pa.

When inquiring check CP 4152 opposite last page

INSTRUMENTATION

**Measures variations
in temperature
to 0.1°F...**

pyrometer covers range from
ambient to 1000°C

Uses: Measuring temperature variations in locations where thermocouples, thermopiles are inadequate or inoperative.

Features: Pyrometer indicates temperature variations as small as 0.1°F. Response time is 25 milliseconds.

Description: Infrared radiation pyrometer covers a temperature



Pyrometer head mounts on tripod

range from ambient to 1000°C and is adapted for remote detection of radiation. Instrument has high sensitivity near ambient and has a large collecting area.

(Radiation pyrometer IR-1 is product of Servo Corporation of America, Dept. CP, 2020 Jericho Turnpike, New Hyde Park, L. I., New York. Check CP 4153 opposite last page.)

Outlines DC source without tubes

Outlining advantages of tubeless power supply units, one-page bulletin describes 15 amp tubeless regulated DC rectifier.

Bul MR532-15A is issued by Perkin Engr. Corp., Dept. CP, 345 Kan. St., El Segundo, Calif. Specify CP 4154 opp. last page.

fully-opened... fully-closed

with the

flick of a finger



HOKE
toggle valves

Hoke toggle valves open and close with a single, positive motion like flipping a light switch. Use them on your precision test equipment for gas or liquid control at pressures up to 1000 psi. Seat and stem seals are tight enough for most high vacuum work.

In instrument panel service you can tell instantly that the valve is open (or closed) and the colored nylon handles identify fluids at a glance.

Available in angle and globe patterns in brass or stainless, 1/4" through 1/2" pipe (or with tube fittings).

May we send you catalog and data sheets?

HOKE

**HOKE
INCORPORATED**

Fluid Control Specialists
145 S. DEAN STREET, ENGLEWOOD, NEW JERSEY

When inquiring check CP 4155 opposite last page

CHEMICAL PROCESSING

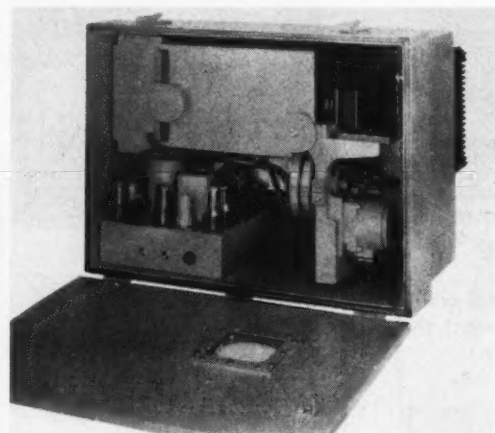
**Automatically checks itself
and re-sets to compensate
for error . . .**

photoelectric unit analyzes, records, controls
processes involving liquids, gases, vapors

Uses: Automatically analyzing, recording, and
controlling chemical processes involving liquids,
vapors, or gases.

Features: Photoelectric analyzer periodically
and automatically checks and re-sets itself to com-
pensate for any smudge accumulation on cell win-
dows or similar sources of error.

Description: Instrument automatically records
quantities of gas or vapor in air, to a few parts
per billion, of substances as mercury, ozone, naph-



Analyzer self-monitors for sources of error

thalene, benzaldehyde, nitrobenzene, bromine, sul-
fur dioxide, xylene, and others. Unit will also
monitor and automatically record analysis of liquids.
Unit can also be set to give an automatic warning
in presence of certain vapors in the air. Instrument
is similar to unit described by L. G. Glasser in
Journal of Optical Society of America, July, 1955.

(Model III Photoelectric Analyzer is product of
Manufacturers Engineering & Equipment Corp.,
Dept. CP, Hatboro, Pa. Check CP 4156 opp. last pg.)

Electro-pneumatic controls

Including a simplified circuit diagram for a three-
action current-adjusting pneumatic controller, six-
page booklet in two colors describes manufac-
turer's current-adjusting electro-pneumatic con-
trollers. Advantages of system are suggested.

Folder ND4(8)40-955 is issued by Leeds &
Northrup Co., Dept. CP, 4901 Stenton Ave.,
Philadelphia 44, Pa. Check CP 4157 opp. last pg.

**to regulate
and record—**

*mechanical
instruments
by*

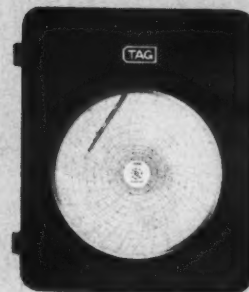
WESTON

**Just
Published!**



Just published...the new catalog M2A
which fully illustrates and describes the
comprehensive line of WESTON me-
chanical instruments, noted for their
long-time accuracy and dependability.
Send for your copy today; or ask your
local Weston representative for help on
any measurement or control problem in-
volving temperature, vacuum, pressure.
Weston Electrical Instrument Corpora-
tion, 614 Frelinghuysen Ave., Newark 5,
N. J., a subsidiary of Daystrom Inc., 200
Elmora Ave., Elizabeth, N. J.

**TEMPERATURE..
PRESSURE..
VACUUM..TIME**



RECORDING INSTRUMENTS . . .
in 9", 10" and 12" chart
sizes — single and multipen
— for all requirements.



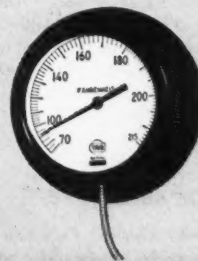
RECORDING CONTROLLERS . . .
handle temperatures from
-325°F to 1000°F—vacuum
to 30" mercury — pressures
to 7500 psi or higher.



TIME CONTROLLERS . . . make
any semiautomatic retort
control system fully auto-
matic. Available in both
standard and special forms.



INDICATING CONTROLLERS . . .
accurately regulate tempera-
ture, vacuum, pressure and
indicate on direct-reading
scale.

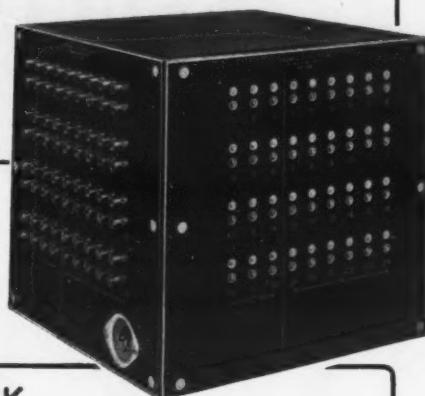


DIAL THERMOMETERS (remote read-
ing) . . . furnished with mercury,
gas, or vapor pressure actuations.
Flush or wall mounting. Indicate
low as -325°F., high as 1000°F.

WESTON *Instruments*

When inquiring check CP 4158 opposite last page

RECORDING TEMPERATURES AND OTHER D.C. SIGNALS ON ONE CHART



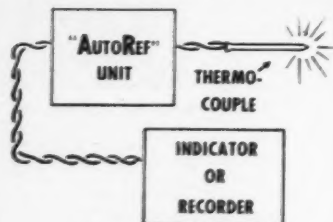
IT'S EASY WITH T-E'S NEW AUTO REF COLD JUNCTION UNIT!



It's easy now... because Thermo Electric has solved one main difficulty involved in such multiple recordings—cold-end compensation for the thermocouple circuits. T-E's "AutoRef" Cold-Junction Units provide a simple, yet accurate solution—constant, predetermined temperature in one, multi-thermocouple reference junction—no longer is there any need for carefully maintained ice baths.

Typically, cold-junction temperatures are controlled to $\pm 1^\circ \text{F}$. over outdoor ambient temperature range. The "AutoRef" Junction can be conveniently placed anywhere in the thermocouple circuit with copper output leads connecting it to indicating or recording instruments.

A typical unit of 36 circuits (illustrated) measures 12"x12"x12" and weighs 25 lbs. Case-type and capacity can be modified, however, to meet specific needs. For example, the "AutoRef" is also available for standard relay-rack mounting. In any operation requiring multiple recording of temperatures and other conditions these "AutoRef" Cold-Junction Units set new standards of convenience and efficiency without loss of accuracy.



Typical Application Circuit

LIKE TO KNOW MORE? WRITE FOR BULLETIN 80R.

Pyrometers • Temperature Monitoring Systems • Thermocouples • Protection Tubes
Quick-Coupling Connectors and Panels • Thermocouple and Extension Wires

Thermo Electric Co., Inc.

Rochelle Park Post Office, SADDLE BROOK, NEW JERSEY
IN CANADA—THERMO ELECTRIC (Canada) Ltd., BRAMPTON, ONTARIO

When inquiring check CP 4159 opposite last page

INSTRUMENTATION & CONTROL

Lists transformers for control uses

Describing complete line of manufacturer's control transformers, catalog of 32 pages includes dimensions, ratings, special features, and wiring diagrams. Section of catalog discusses control transformers for special applications, as operation of solenoid operated valves, fans and blowers, pumps, relays, electronic equipment. List prices and weights are also given.

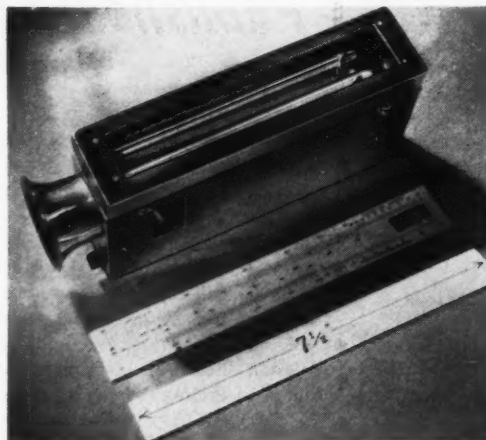
Bul GED-2767 is issued by General Electric Company, Dept. CP, One River Road, Schenectady 5, N.Y. When inquiring reader may simply check CP 4160 on the convenient Reader Service slip which is located opposite last page.

Measures relative humidity without whirling in air...

water reservoir eliminates need for wetting wick; contains water for one week

Uses: Measuring relative humidity in connection with controlling processes and storage conditions where humidity is important.

Features: Psychrometer is portable, motorized, battery-operated. It is not necessary to whirl the instrument in the air.



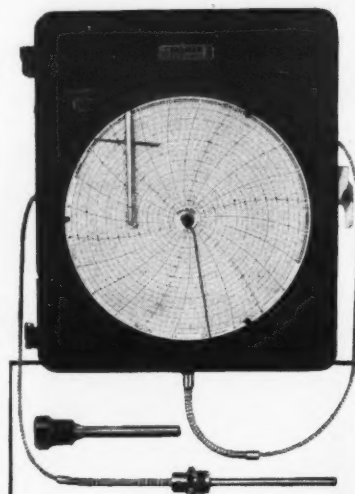
Overall length of battery-operated psychrometer is 7 1/2"

Description: Instrument functions like standard sling psychrometer except that air is sucked past thermometer bulbs by motor and fan instead of by whirling the instrument in air. Psychrometer consists of a housing with an air intake tube connected to a duct system with exhaust slots. Unit consists of high-speed, 4 1/2-volt motor with nylon

PALMER

MERCURY ACTUATED recorders

Into this modern Mercury Actuated Recorder has gone all the skill of Palmer master craftsmen.



Readings are clearer, smoother and more precise than ever thought possible. In fact readings are so amazingly improved that maintenance is never needed under normal uses.

Recording Thermometers feature twelve inch die-cast aluminum case with black wrinkle or white satin finish. Single or multiple pen construction. Electric or spring wound clock, 24 hour or 7 Day Revolution. Flexible Armor and bulb of stainless steel. Ranges —40 to 1000°F. or Equivalent in °C.

Send for Bulletin No. 45

Consult your Classified Directory

PALMER

THERMOMETERS, INC.

Mrs. of Industrial Laboratory,
Recording and Dial Thermometers
Cincinnati 12, O.

When inquiring check CP 4161
opposite last page

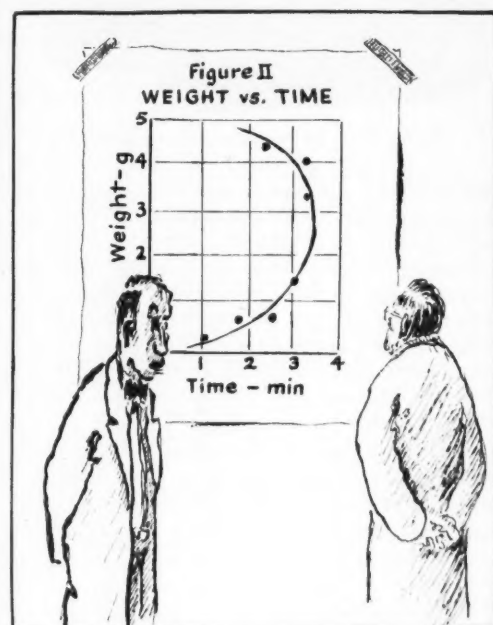
CHEMICAL PROCESSING

fan blade, three standard flashlight batteries for power supply, pair of calibrated thermometers, water reservoir and wick connected to wet bulb thermometer, off-on switch.

Thermometers are shock-mounted with spring clips and rubber grommets. Water reservoir eliminates need for wetting thermometer wick before each test. Reservoir contains enough water for about a week's use when operated intermittently on a daily basis. With motor and fan on, thermometers will stabilize in about 20-30 seconds. Fast reading is possible because wick is always wet.

One model is supplied with a light bulb for use at night or in dark places. Portable psychrometer is $7\frac{1}{2} \times 3\frac{1}{4} \times 1\frac{1}{2}$ inches and weighs $1\frac{1}{2}$ lb with batteries.

(Model 16W-923 Psychrometer is product of G. M. Manufacturing Co., Dept. CP, 50 W. 3rd St., New York 12, N. Y. . . or for more information check CP 4162 on form opposite last page.)



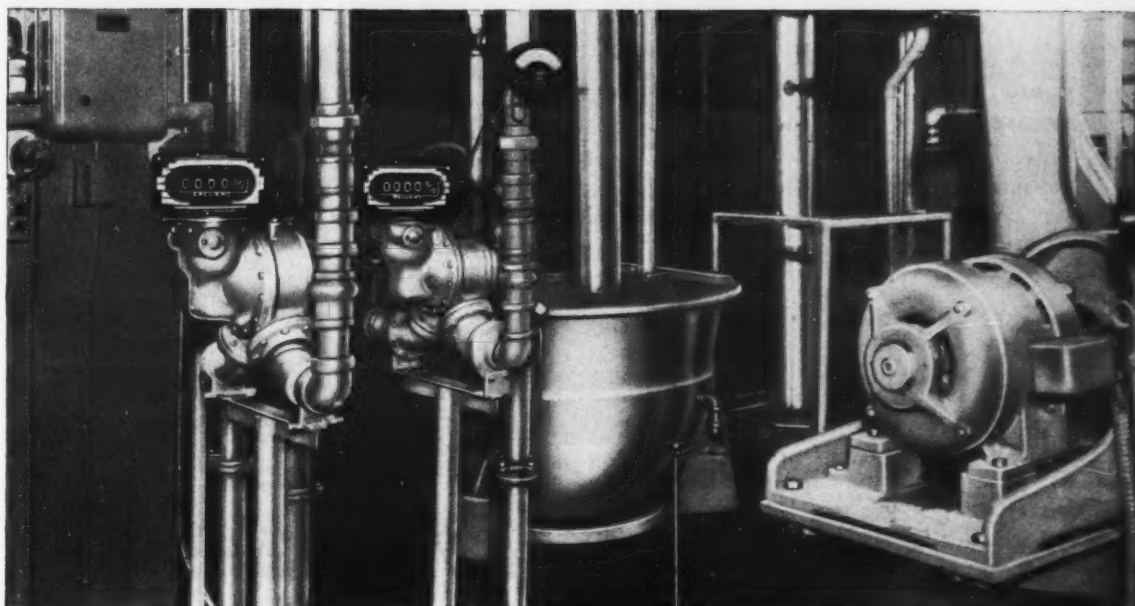
"This is going to be tough to explain."

Our thanks to John Hartsock, chemical engineer at Stanford Research Institute, Menlo Park, Calif., for this cartoon.

Have you a cartoon idea? It could be worth \$\$ to you! See the notice on page 23.

Rockwell Stainless Steel Meters

MEASURE CORROSIVE LIQUIDS—FAST!

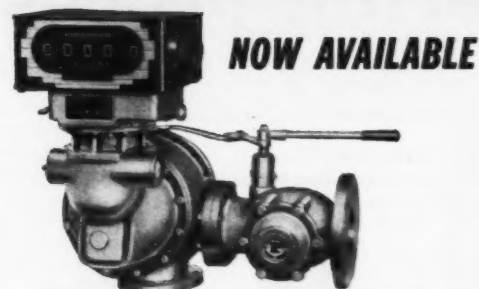


For Foods, Pharmaceuticals, Chemicals and Liquors

These Rockwell meters are constructed *inside and out* of stainless steel. With them you can get positive liquid accounting over a multitude of fluids that cannot be measured by ordinary meters. You can use them *with profit* to cut liquid handling and processing costs, to guard the quality of your end products, to stop losses. And your accountants will welcome these meters for cost control and tax analysis purposes. Get full facts now. Use the handy coupon—or write for bulletins.

Use For All These Purposes

- Liquid Delivery Control
- Formula Control—Cost Control
- Product Quality Control
- Departmental & Inventory Control



Automatic Pre-Set Meter Shut-off *without shock.* All stainless construction. Just pre-set the quantity to be measured, then meter and automatic valve take over to shut-off flow in three (3) smooth successive stages without harmful hydraulic shock.

—CLIP COUPON MAIL TODAY—

ROCKWELL MANUFACTURING COMPANY 106C
Pittsburgh 8, Pennsylvania

Gentlemen:

I am interested in measuring _____ (Name of Liquid)

Pipe Size _____

Working Pressure _____ psi Temperature _____ °F max.

Max. Flow Rate _____ gpm Min. Flow Rate _____ gpm

YOUR NAME _____

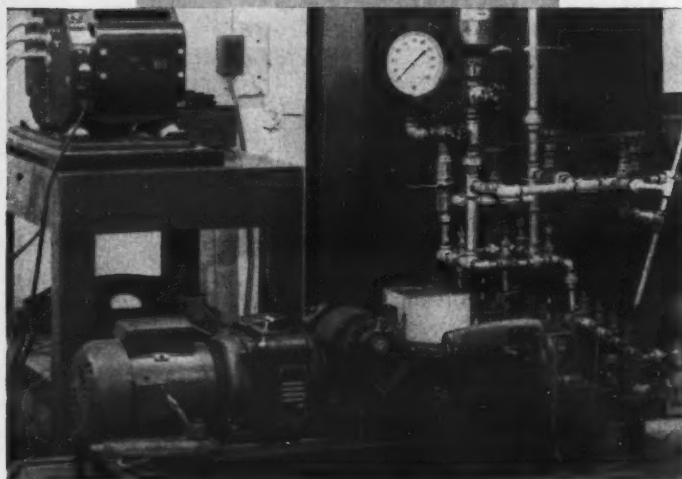
COMPANY _____

STREET _____

CITY _____ ZONE _____ STATE _____



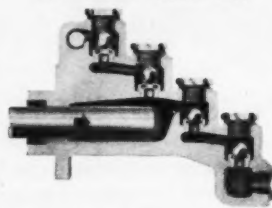
When inquiring check CP 4164 opposite last page



Standard motor-driven Controlled Volume Pump being tested for accuracy by independent research organization. For details of test procedures and results, write for Technical Paper No. 55-1-1.

Required accuracy for metering process additives

Exclusive Milton Roy STEP-VALVE LIQUID END



Double ball checks, sloping passages and absence of air pockets assure highest possible volumetric efficiency. Should a solid particle lodge under one suction ball, for example, second suction ball will seat on discharge stroke, thereby preventing fluid from being pumped into suction piping.

THE INHERENT accuracy (within \pm one percent) of Milton Roy Controlled Volume Pumps can solve your chemical metering problem. As flow controllers, these units simultaneously meter and pump process fluids. As ratio controllers, they maintain a fixed relationship between additives and process streams. As final control elements they contribute to accurate regulation of pH and other process variables.

There is a Milton Roy Controlled Volume Pump or chemical feed system for practically every chemical metering need. Capacities range from 3 milliliters per hour to 45 gallons per minute, with flexible adaptations for manual or automatic control of pump capacity. Pressures up to 50,000 psi.

Write for application data contained in the bulletins listed below. One of these will probably suggest the simple, economical solution to your chemical metering problem.

Bulletin 455 "Controlled Volume Pumps in Paper Making"
Bulletin 953 "Controlled Volume Pumps in Industrial Water Treating"

Bulletin 1253 "Controlled Volume Pumps in Process Instrumentation."

Milton Roy Company, Manufacturing Engineers, 1300 East Mermaid Lane, Phila. 18, Pa.



Engineering Representatives in the United States, Canada, Mexico, Europe, Asia, South America and Africa.

When inquiring check CP 4165 opposite last page

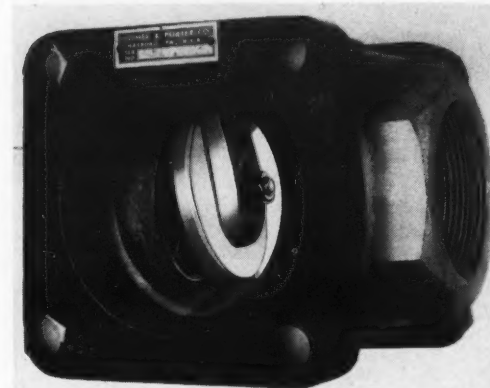
INSTRUMENTATION & CONTROL

Sight flow indicator plus check valve in one unit . . .

has self-aligning soft seat flapper which prevents back flow

Uses: For indicating flow in LPG and anhydrous ammonia service, or other applications requiring flow indication with positive check of back-flow.

Features: Sight flow indicator has through bolted construction which permits cleaning sight glasses without removing unit from pipeline.



Thick windows are removable for easy cleaning

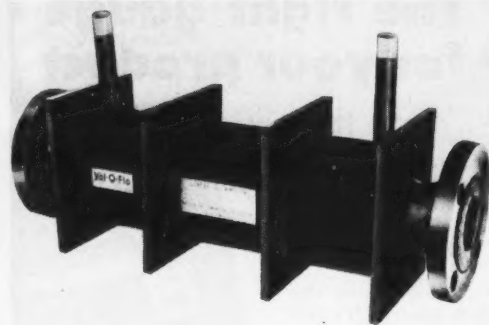
Description: Indicator has self-aligning soft seat flapper which prevents back-flow. Two $\frac{1}{2}$ " thick windows on opposite sides of body fitting — removable for easy cleaning — indicate whether or not there is flow. This indicator does not measure rate of flow. Standard sizes are for 2" pipe, with an operating pressure rating of 250 psi and for $1\frac{1}{2}$ " pipe with a rating of 300 psi. Indicator bodies are of bronze or steel. Gaskets are of Thiokol.

(Fig 213 Bull's Eye check valve indicator is product of Fischer & Porter Co., Dept. CP, 48 Jacksonville Rd., Hatboro, Pa. . . or for more information check CP 4166 on form which is located opposite last page.)

Linearly indicates gas flow in volumetric units to 2000 psi . . .

designed so that differential pressure across flow element is proportional to volumetric flow

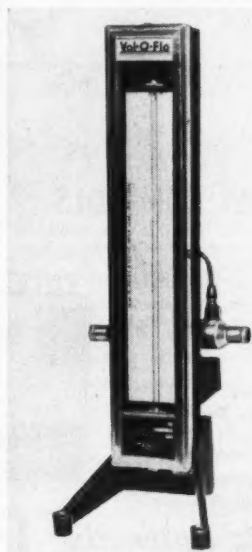
Uses: Metering flow volume for steam and most of the common gases at pressures from one inch Hg absolute to 2000 psi.



Gas flow element develops differential pressure indication linearly proportional to volumetric flow

Features: Flow element is designed so that a differential pressure is developed directly proportional to volumetric flow. Meter linearly indicates directly in volumetric flow units.

Description: Flow meter consists of a rigid all-metal linear flow element coupled to an accurate and rugged manometer. Flow element is so arranged as to provide a multiplicity of flow channels in which the Reynolds number is kept below 400 at full-scale flow. A low Reynolds number insures the flow in the element will be insensitive to upstream disturbances. In addition, the unit may be piped close to a valve or bend without affecting calibration.



Gas flowmeter consists of flow element coupled to manometer

Suggested advantages of the flow element are linear scale indication, low overall pressure drop, volumetric flow indication independent of density, mean flow indication for pulsating flows, relative insensitivity to turbulence. Dimensions of the flowmeter assembly are 19 x 9 x 10". Weight is fifteen pounds.

Gas flow element is available separately from gas flow meter.

(Model 10 element and Model 20A Flowmeter are products of National Instrument Laboratories, Inc., 6108 Rhode Island Ave., Riverdale, Maryland . . . or for more information about manufacturer's product reader may simply check CP 4167 on form opposite last page.)

DISTILLATION COLUMN CONTROL



GEORGE E. HOWARD, Manager
Application Engineering Dept.

"Unquestionably, our reputation for successful distillation column control is based on broad experience with every type of distillation problem, and a complete line of instruments that meets every need."

PROBLEM

To obtain required separation of components in a batch distillation column in the shortest practical time at the lowest possible cost. This is complicated by the fact that composition of the charge varies continuously, which means that the reflux ratio must be continually adjusted.

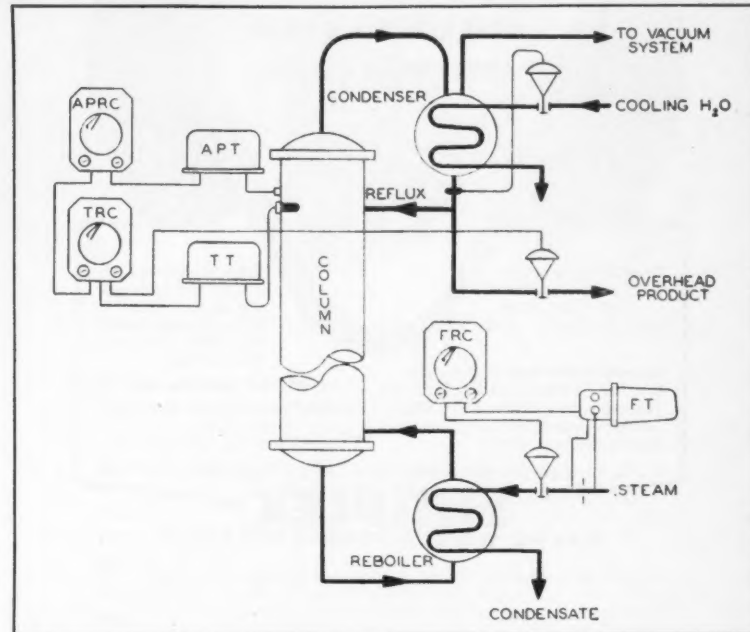
SOLUTION

Maintain constant heat input to column reboiler and automatically vary reflux ratio to hold specified overhead composition.

INSTRUMENTATION

Steam flow controller maintains heat input at the value required for optimum vapor velocity as determined by column design. Flow transmitter is located directly at point of measurement for ease of installation and maintenance. Receiver controller gives continuous chart record for evaluating operation and for accounting purposes.

Column Temperature Controller regulates reflux to accurately maintain equilibrium temperature in the column. Since equilibrium temperature



One of a series of basic instrumentation recommendations for the unit operations

is a measure of composition, this is an effective means of holding overhead product at required purity. Precision control depends upon instantaneous detection of column temperature changes hence SPEED-ACT* response in the transmitter is used to overcome inherent measurement lag. Similarly, PRE-ACT* response in the controller gives fast corrective action to overcome inherent lags in processing equipment.

Column Pressure Controller senses absolute pressure changes in the column and automatically adjusts the column temperature controller to compensate for the effect of pressure changes on the equilibrium temperature. A narrow range, barometrically compensated pressure transmitter locally mounted detects the slightest change in column absolute pressure. Chart records on temperature and pressure controllers provide a constant check on column operation and product quality.

Overhead Product Temperature Controller regulates the flow of cooling water to insure complete condensation of overhead vapors. This controller also prevents excessive subcooling of reflux that would result in unnecessary heat load on the column reboiler.

BENEFITS

1. Constant product quality.
2. Minimum operating cost.
3. Continuous record of process operation.
4. Elimination of tedious manual adjustment.
5. Precision control despite process-load changes.

Send for Data Sheet No. 11 for other control recommendations for batch and continuous distillation; or call in your Taylor Field Engineer. Taylor Instrument Companies, Rochester, N. Y., and Toronto, Canada.

*Trade Mark

Taylor Instruments **MEAN ACCURACY FIRST**

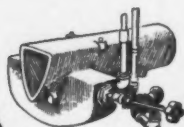
When inquiring check CP 4168 opposite last page

Self-scouring! SIMPLEX PARABOLIC FLUME

Measures open flows within $\pm 2\%$

...over full 20 to 1 range!

PLANT WASTES • ALKALIES
ACIDS • WATER • SLUDGE



Type S Flume is used alone to indicate flow ... with meter to record, totalize.

Smooth transition from circular inlet to parabolic outlet speeds flow, keeping flume clear. Big chamber traps sediment, keeps piezometer hole clean.

Easy to install! No special approach piping needed. Inlets fit 6" to 36" pipe. Leveling pins simplify field setting.

WRITE FOR BULLETIN 800
Simplex Valve & Meter Company
Dept. CP-3
7 East Orange St., Lancaster, Pa.

Accurate instruments and controls since 1904

SIMPLEX
VALVE AND METER COMPANY

When inquiring check CP 4169 opposite last page

THERMOCOUPLES for every industry



DATA BOOK

New
32-page
file book

- ★ Handily lists all data (I.S.A.) and
- ★ Graphically shows easiest way to select precisely the best thermocouple and protective tube for each operation.
- ★ Lists all components, with prices and
- ★ Provides handy reference for stock record.

FREE
write for
your copy
Now...

WEST Instrument
CORPORATION
CHICAGO
SALES OFFICES IN PRINCIPAL CITIES

When inquiring check CP 4170 opposite last page

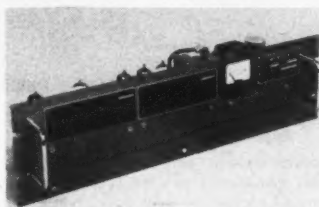
INSTRUMENTATION

Controls DC-pneumatic Instrument system from panel

Uses: Controlling manufacturer's "American-Microsen" process control system which converts pneumatic measurements to direct current for transmission.

Features: Control unit is designed for mounting on a standard relay rack and can be placed wherever convenient.

Description: Prefabricated cable harness connects the units of the



Control unit is designed for rack mounting

system. Control unit is all-electronic and operates system through transducer. Rack-mounting design allows control units to be mounted one above the other. Continuous panel surface can be formed with all control adjustments at front for proportional, reset and rate actions. Controller racks can be placed within the panel cubicle, or to rear or sides of panel enclosure.

(Control unit is product of Manning, Maxwell & Moore, Inc., Dept. CP, Stratford, Conn. ... or check CP 4171 opposite last page.)

Suggests digital method to measure phase

Describing a technique for precise phase measurement, eight-page booklet includes discussion of theory. Method suggested can be used to calibrate synchros and resolvers, to measure phase characteristics of closed-loop servo systems.

Data File 107 is issued by Berkeley Div., Beckman Instruments, Inc., Dept. CP, 2200 Wright Ave., Richmond, Calif. Specify CP 4172 opp. last page.

The right gauge for your product

...is in the new
**MARSH
CATALOG**



Turn the pages of this catalog, and you'll know why the most discriminating manufacturers equip their products with Marsh instruments.

Hundreds of types, styles, mountings and ranges are covered; all share one common attribute ... the best and most economical you can buy for a given set of design and service conditions.

MARSH INSTRUMENT CO. Sales Affiliate of Jas. P. Marsh Corp. Dpt. Z, Skokie, Ill.
Marsh Instrument & Valve Co. (Canada) Ltd., 8407 163rd Street, Edmonton, Alberta, Canada



When inquiring check CP 4173 opposite last page

ACCURATE Lumenite Electronic LIQUID LEVEL CONTROLS

With no floats—no moving parts in the container (except non-conductive liquids) these Lumenite Electronic Liquid Level Controls maintain exact levels of water, milk, syrups, etc., in tanks, reservoirs, boilers, processors, freezers — either open or under high pressure.

Clean—Sanitary
Simple to Install
Require no Servicing

Write for
Bulletin FLM—on Liquid Level Controls
Bulletin ITC—on Ice Thickness Controls
Bulletin FN—on Non-Conductive Liquids



DEPENDABLE Lumenite Automatic TIMING CONTROLS

Lumenite Timers are the simplest, sturdiest and longest life. Accurate to fractions of a second, they speed and make more accurate all types of timed production.

For Details ask for
Bulletin LT—Standard Time Switches
Bulletin CR—Cycle Repeating
Bulletin PC—Program Clocks
Bulletin R—Time Delay Relays
Bulletin RMC—Auto. Reset Timers
Bulletin ET—Electronic Timers
Electronic or Electric Controls
and Timers designed for special service.

Lumenite Electronic Company
407 S. Dearborn St., Chicago 5, Illinois

When inquiring check CP 4174 opposite last page

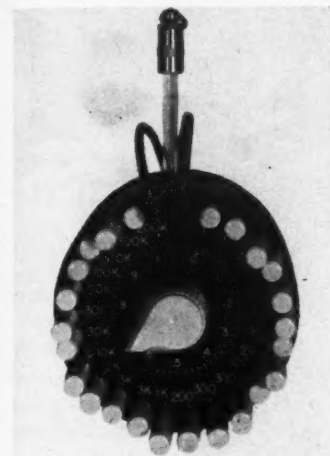
CHEMICAL PROCESSING

**Rugged, small design
feature of standard
resistance**

Uses: As stable and accurate resistance standard for instrument test and maintenance.

Features: Resistance box has range from 0 to 999,999 ohms and 0 to 99,999 ohms, in steps of one ohm.

Description: Instrument consists of stable and accurate resistances connected in series, adjust-



Pushbuttons allow measurement to one megohm in steps of one ohm

able to desired values by selective shorting. Pushbuttons or banana connectors of standard design are used. Resistance is read directly in ohms on dial. Resistances are hermetically sealed in oil or epoxy resin for protection against humidity, exposure, shock, vibration. Resistance standard includes a thermometer.

Nominal ratings of individual resistances are $\frac{1}{2}$ watt. Resistance accuracy at 25°C is ± 0.005 ohms.

(Resistance standards are product of Consolidated Resistance Company of America, Inc., Dept. CP, 44 Prospect St., Yonkers, N. Y. Check CP 4175 opp. last page.)

For more information on product at right, specify CP 4177... see information request blank opposite last page.

Simplicity and Good Design Features in POWERS

FLOWRITE VALVES



**STURDY,
PRACTICAL
DESIGN**

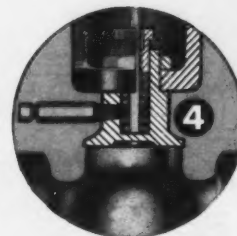
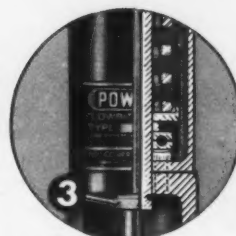
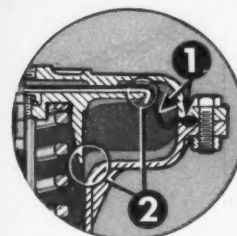
Strong, light weight precision cast alloy housing is corrosion resistant. Only 6 bolts saves maintenance time.



OVER 60 YEARS
of Temperature and
Humidity Control.

Ball Check Lubricator with
Silicone grease for
temperatures 40° to 500° F.

(b98)



give close control and they last longer

1 Diaphragm has a formed bead which provides increased sealing action with increasing control pressure. It has no bolt holes. Diaphragm lasts longer.

2 Piston plate assembly has a free floating thrust plate which absorbs side thrust. Closely guided piston plate maintains valve stem in accurate alignment. High tensile strength steel spring is cadmium plated and completely enclosed.

3 Adjustment screw is non-rising ball bearing type cadmium plated, easily accessible, easy to adjust.

4 Packing: Deep packing space contains preformed lubricated packing readily accessible. Note lubricator.

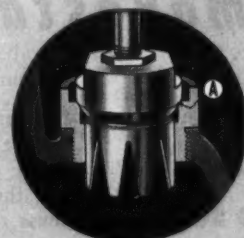
Accurate control results from smooth rolling diaphragm and minimum of valve stem friction.

Right type and size of valve is important for good control. An experienced Powers engineer will gladly help you make the right selection. Call our nearest office or write us direct.

AT NO EXTRA COST POWERS CONTROL SYSTEMS

Include these Premium Quality Valves

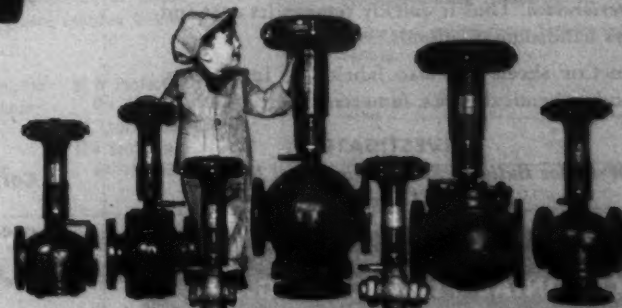
Get complete information, write for series 344 bulletins



Renewable Stainless
Steel, Disc and Seat.

**Compare POWERS
Single Seat Valves**
with other high quality valves. Check their performance, tight shut off feature and sturdy construction.

Available: Composition Disc also V-Port characterized which gives straight line control. Separate shut off seat (A) reduces wire drawing, insures tight shut off.



SINGLE SEAT • DOUBLE SEAT • 3-WAY MIXING VALVES

Established 1891 **THE POWERS REGULATOR COMPANY** Skokie, Illinois

Offices in Chief Cities in U.S.A., Canada and Mexico, See Your Phone Book

DEPENDABLE

Is Corrosion
"Eating Up"
Your Profits?



investigate

Van-Cor

PIPE, FITTINGS, VALVES

Van-Cor is an unplasticized polyvinyl chloride that resists the corrosive action of hundreds of industrial acids and alkalis as well as sewage waste and brine. Van-Cor piping costs less, is lighter in weight, and easier to install than conventional pipe. It is readily formed, machined, threaded and welded. On many installations where metallic piping was eaten up in a few months, Van-Cor pipe has served for years without deterioration. Thus it quickly returns its cost and pays handsome dividends.

Van-Cor sheets are also fabricated into ducts, hoods, chemical tanks, fumestacks, etc.

INVESTIGATE!

Write for Bulletin, Specifications and Name of
Nearest Distributor.

INDUSTRIAL DIVISION OF
COLONIAL PLASTICS MFG. CO.

SUBSIDIARY OF THE VAN DORN IRON WORKS CO.
2685 EAST 79th STREET • CLEVELAND 4, OHIO

When inquiring check CP 4178 opposite last page

corrosion control



Section of glass-protected stack erected in 1953 is bolted to flanges. This stack shows no evidence of corrosion after three years service

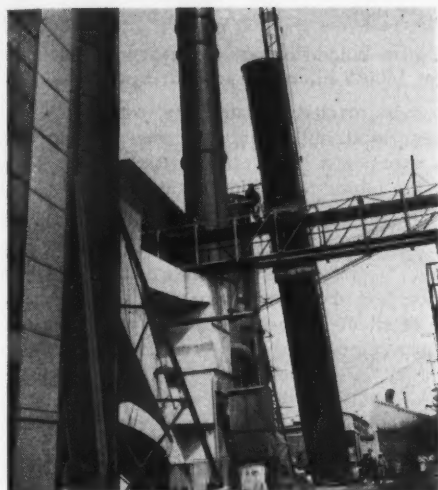
Conservative estimates based upon research work
and use of units in manufacturer's own plant
show that use of glass-coated stack can more than —

double smokestack life

Corrosion-resistant stack should have
great value wherever industrial wastes
are consumed or chemical vapors
vented, in addition to usual boiler
house use

Problem: Boilerhouse stacks corrode and fail because of acid vapor condensation which occurs in the cooler upper sections. Life of an average $\frac{3}{8}$ " thick unlined steel stack serving a boiler house ranges from a minimum of five years to a maximum of 15-20 years. Although average life is 10-12 years for conventional boiler house applications, service may well be much shorter where industrial wastes are consumed, corrosive vapors

CHEMICAL PROCESSING



Stacks were easily erected by millwrights with no experience in handling glass-coated objects. Note blue-black impervious finish on exterior, as well as interior, which requires no painting

vented, high sulfur coals or oils used, or where intermittent usage allows frequent cool-downs below acid condensation point.

Solution: A Milwaukee manufacturer of processing equipment who became aware of the problem through frequent failure of its own seven stacks undertook a research program in 1950 on the use of glass-protected steel for smokestack purposes. Six varieties of glass were tested during the initial 20 months of the study. In some cases samples half glass-coated were hung or attached to various inside parts of the stacks to determine the difference in corrosion rate.

After determining that certain of these glass coatings were totally unaffected, a six foot diameter by 44 foot long glass protected stack was placed in service in the manufacturer's own plant early in 1953. In 1955 a similar, though more advanced, stack seven feet in diameter and 78 feet long was placed in service in the same plant. Glass-protected stack costs approximately 50% more than a conventional steel stack.

Advanced type glass coatings now in use (more than three times as acid resistant as those formerly used) are highly resistant to impact and abrasion, will flex with the metal up to the point where metal becomes deformed. Thus, normal stack sway will not impair the glass coatings, which also will resist any anticipated thermal shock. Service temperatures up to 750°F may be tolerated. Standard thickness of usual two coatings used is approximately .012. Present production is limited to sections 3' to 8' in diameter up to 20' in length, flanged for bolting at each end. Color of glass

(Please turn to next page)

How Stauffer Chemical whips fan corrosion

Silver metallizing
stretches wheel life from 6 weeks
to better than one year
in corrosive gases.



Fan rotor being metallized with silver for protection against corrosive gas

The *Stauffer Chemical Company*, Niagara Falls, N. Y., operates a chloro-organic acid unit in which process fans are used to convey corrosive gas in the operation of a column. Gas is primarily anhydrous hydrogen chloride, contaminated with small quantities of chloro-organic acid compounds.

A number of different coatings were tried out in an effort to prolong the life of the stainless steel wheels and shafts, as well as the cast-iron housings. Best of these lasted 4 to 6 weeks on the wheels, 2 to 4 months on the housings.

Test work carried on with *Metal-Cladding, Inc.*, of North

Tonawanda, N. Y., indicated that fine silver was relatively unaffected by the gases in use. So the first wheel was metallized with this material after the base metal had been mechanically cleaned, sprayed with .005" of molybdenum for a bonding base, and .020" of nickel for toughness. Final silver coating was .025" thick.

A year later the first metallized surfaces were still in excellent condition. Since the cost of the metal spray work was about equal to the cost of a new untreated unit, the application paid for itself in about three months. In addition, inspection time and downtime were substantially reduced.

The following **Metco*** System contractors are set up to help you solve your corrosion problems with metallizing. For further information or copy of descriptive bulletin, write, wire or phone **Metco Systems** headquarters, address and phone number below.

*Reg. U.S. Pat. Off.

**Metco
System
Contractors**

Akron Sand Blast Co.
Arthur Tickle
Engineering
Works, Inc.

Dix Engineering Co., Inc.
F. W. Gartner Company
Gulf Engineering
Company, Inc.
Metal-Cladding Inc.

M W Protective Coatings
Div. of Metalweld, Inc.
St. Louis Metallizing Co.
The Southern
Galvanizing Company

METCO SYSTEMS
10 Bridge Street,
Westbury, Long Island, N. Y.

Please send me descriptive bulletin on the Metco Systems.

name _____

title _____

company _____

address _____

city _____ zone _____

state _____

Metco Systems

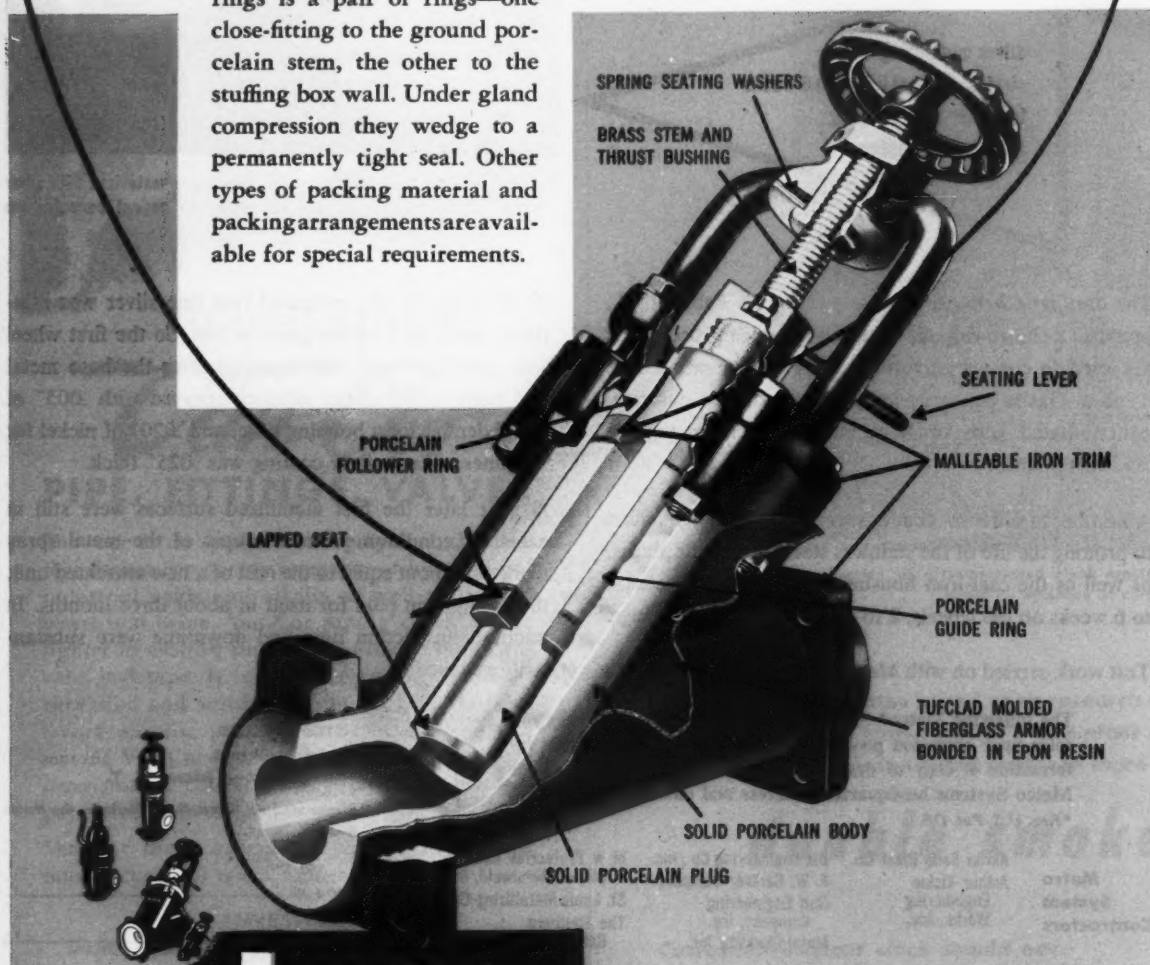
10 Bridge Street, Westbury, Long Island, New York
Telephone: Edgewood 4-1308

When inquiring check CP 4179 opposite last page

Teflon Packing

... "all-service"
... maintenance-free
in Lapp Valves

Solid, unfilled Teflon, in a wedge-ring arrangement, provides a packing for Lapp Porcelain valves which is long in serviceability, short on maintenance requirements. Each of the two sets of Teflon wedge-rings is a pair of rings—one close-fitting to the ground porcelain stem, the other to the stuffing box wall. Under gland compression they wedge to a permanently tight seal. Other types of packing material and packing arrangements are available for special requirements.



Lapp

PROCESS EQUIPMENT

Chemical Porcelain Valves • Pipes • Raschig Rings
Pulsafeeder Chemical Proportioning Pumps



Y-valves, angle valves, flush valves, safety valves, and plug cocks of Lapp Porcelain have standard bolt-circle flanges for easy connection to all piping and equipment. Write for bulletin with complete description, characteristics, and specifications. Lapp Insulator Co., Inc., Process Equipment Division, 439 Wendell St., LeRoy, N. Y.

CORROSION CONTROL

Glass-coated Smokestack

(Continued from preceding page)

coating is blue-black and is fused to 1/4" rim steel at 1600°F in two separate firings.

Two stacks erected to date were installed by two different local millwrighting firms with no previous experience in handling glasscoated objects. With the minor precaution of using padded steel slings these firms reported no difficulties whatsoever in the erection of these units.

Results: Two stacks in service, one of which was installed about three years ago, show no evidence at all of corrosion inside or out. This performance compared with the replaced stacks which had lasted only seven years in the same service, plus the results of the extensive research work of the last six years, indicate that by conservative estimates the life of a steel smokestack can be more than doubled through the use of glass protection applied during the manufacture. In addition to savings possible in conventional boiler installations, glass-protected stacks should be particularly valuable in plants where industrial wastes are consumed, corrosive vapors vented, or where unusually low flue gas temperatures are encountered.

Since impervious finish is applied to the outside of the stack as well as to the inside, it will easily resist the corrosive effects of industrial or seaside atmospheres. The attractive blue-black gleaming exterior requires no painting and sheds soot and grime better than plain steel, resulting in maintenance dollar savings and improving the appearance of the plant.

Two stacks erected to date were made of 1/4" thick rim steel rather than the 3/8" of their predecessors. This extra 1/8" of steel was used formerly as anti-corrosion margin only and was not required by codes. Superior corrosion resistance of the glass-protected stack eliminates this excess steel with resultant savings in weight. The total weight of glass coatings is but five ounces per square foot.

Recently introduced under the name Permugas Smokestacks, over 10 units are scheduled for manufacture during spring of 1956.

(Permugas Smokestacks are a product of the A. O. Smith Corporation, Process Equipment Division, Dept. CP, Box 584, Milwaukee 1, Wis. . . or for more information check CP 4180A on form which is located opposite last page.)

The alphabetical Product Directory (starting on page 213) will give you a page reference to all articles and advertisements in this issue

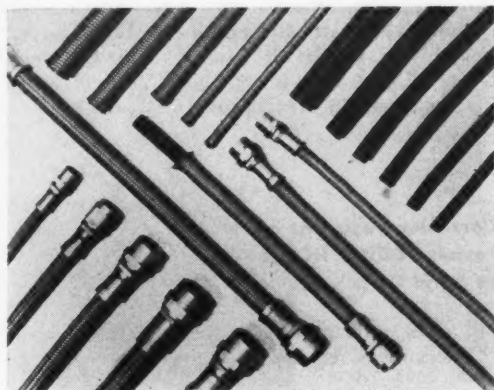
When inquiring check CP 4180 opposite last page

**Operating range of hose
with innercore of Teflon**
Is -100 to +450°F...

resists corrosive fluids and solvents, is light in weight

Uses: Although designed originally for use in jet planes, high temperature and chemical resistance of hose makes it suitable for a variety of chemical applications where these conditions must be met.

Features: Hose has a practical operating range from -100 to +450°F. It also has high resistance to chemical attack by solvents and corrosive fluids.



Hose to handle corrosives at high temperatures

Hose is approximately 45% lighter and 29% smaller in overall diameter for the same inside diameter than equivalent conventional hose.

Description: Hose has an inner core made of Teflon. Formed directly onto the inner core is a braid of stainless steel wire which provides the innercore with a high temperature-resistant support against high internal pressures. Hose is available in sizes from 1/4 to 1 1/4" nominal OD.

(Teflon hose is product of Titeflex, Inc., Dept. CP, 500 Frelinghuysen Ave., Newark 5, N.J. . . or check CP 4181 on form opposite last page.)

**Helpful data on PVC fittings
and flanges**

Twelve-page booklet gives useful data for threaded and socket types of PVC fittings and PVC flanges in both normal and high impact grades. Photographs of typical applications are shown.

"PVC Pipe Fittings and Flanges" is issued by Tube Turns Plastics, Inc., Dept. CP, 2929 Magazine Street, Louisville 1, Ky. When inquiring specify CP 4182 on form opposite last page.

ECONOMY

High-alloy layer—usually 10% or 20% of total plate thickness—assures corrosion and abrasion resistance, long equipment life.

DESIGN FREEDOM

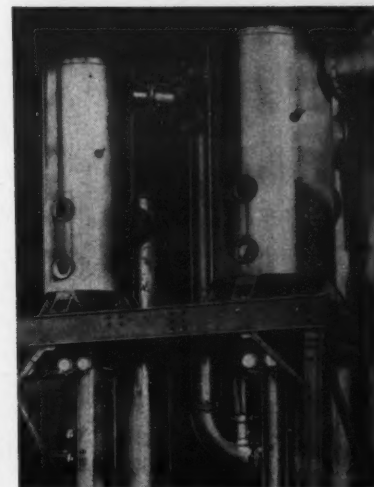
Integral bond allows design and fabrication of shapes to meet process and space needs.

STRUCTURAL STABILITY

Low-cost carbon steel backing provides necessary strength and rigidity.



Nickel-clad steel in this double effect evaporator guards against product contamination.



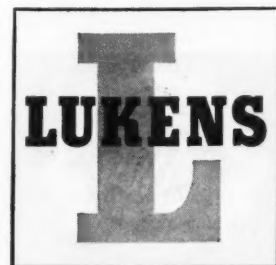
CLAD STEEL EQUIPMENT PERMITS FULL DESIGN FREEDOM

For pressure, vacuum or cyclical service, economical clad steels give you maximum freedom of design in tanks and pressure vessels. Clad steels are readily worked by conventional fabricating tools and methods, can be formed to shapes that best suit space and process needs. Because of the integral bond between high-alloy cladding and the carbon steel backing plate, full gage consideration is permissible under the ASME Code. You're assured of extra-long service life, too, since openings can be cut and attachments welded to clad steel without harming this bond or allowing seepage.

By using clad steels, you get all the advantages of solid, high-alloy construction—protection from corrosion, abrasion and product contamination—with savings up to 50%

in material costs. These and other benefits, like fast heat-up, easier cleaning and low maintenance, can be obtained from 16 cladding materials—various types of stainless, nickel, Inconel, Monel, copper.

These are supplied with a standard sodium hydride finish, or may be polished to help improve performance characteristics. When you're thinking of new tanks and vessels, qualified equipment builders can help your engineers and consultants take advantage of versatile Lukens' Clad Steels. We work closely with fabricators to help select the type most suited to your processing needs. To get more information, ask one of your equipment builders, or write Manager, Marketing Service, Lukens Steel Company, 750 Lukens Building, Coatesville, Pennsylvania.

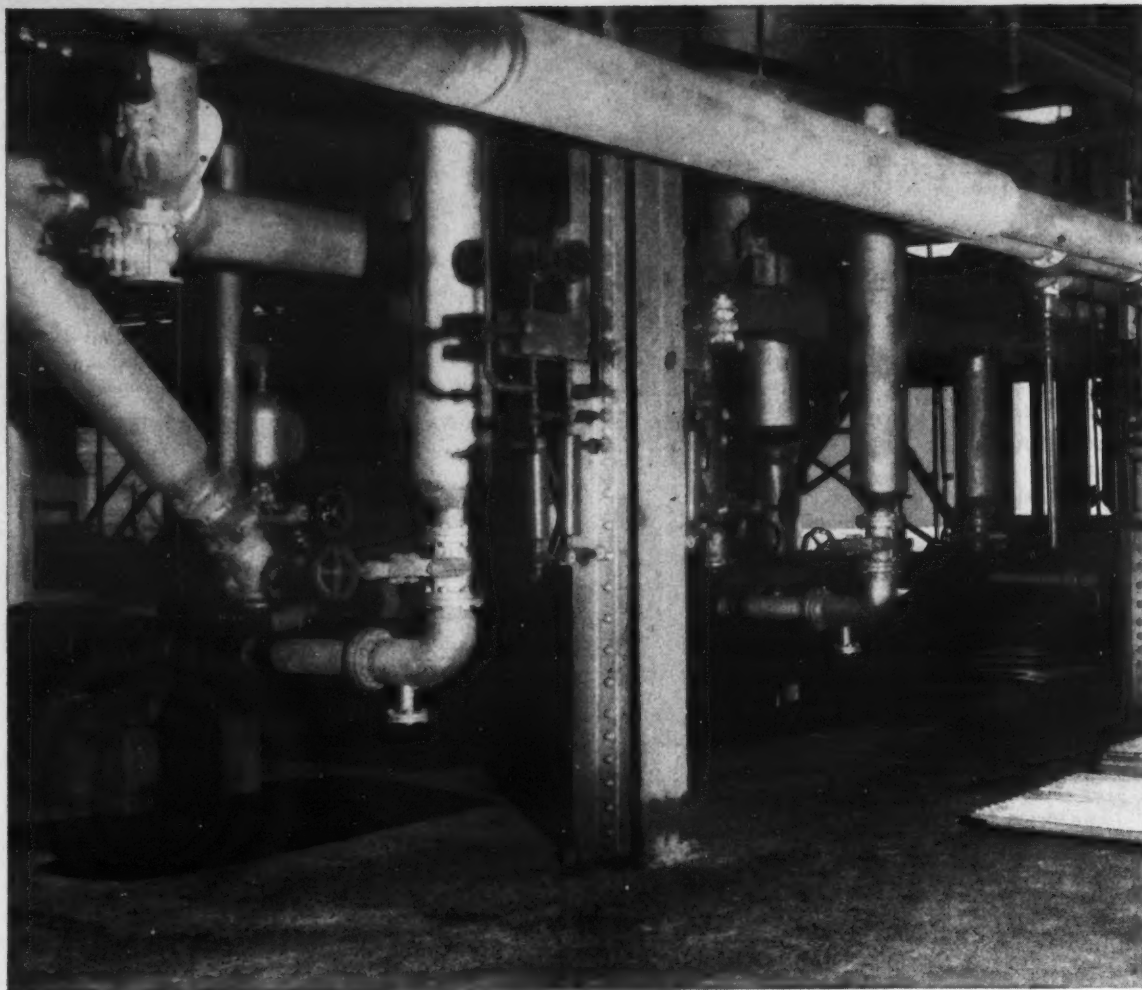


LUKENS CLAD STEELS

STAINLESS-CLAD • NICKEL-CLAD • INCONEL-CLAD • MONEL-CLAD

PRODUCER OF THE WIDEST RANGE OF TYPES AND SIZES OF CLAD STEEL PLATES AND HEADS AVAILABLE

When inquiring check CP 4183 opposite last page



Dependably Yours, too!

The men who know—experienced engineers who specify equipment for handling corrosive liquids—usually pick LaBour pumps.

In the large paper mill shown above, LaBour pumps handle the black liquor evaporating process. The designing engineers knew they could depend on LaBour pumps for continual day-in, day-out service with minimum interruption . . . and so can you.

It's this dependable performance and low maintenance

cost that has motivated engineers, for the past 30 years, to specify LaBour pumps for their toughest chemical applications. With this enviable and unequalled background, LaBour pumps are the safe choice for your needs, whenever and whatever they might be.

So, take a tip from the experienced . . . don't lose unnecessary "down time" in your plant due to pump failure. LaBour pumps can be Dependably Yours, too.

LABOUR



When inquiring check CP 4184 opposite last page

CORROSION CONTROL

Rainbow coating of seven coats permits operator to tell where units are worn . . .

system has been successfully used with reactivator for brine

Method of corrosion protection for processing equipment consists of applying five to seven coats of different colored paint on a unit. As protective coating wears off, it is possible to tell from the color showing just how much wear has occurred.

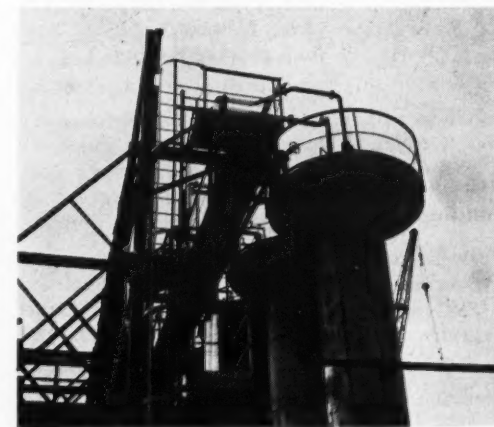
Manufacturer has found system to be highly successful when used on reactivator for treating brine, as well as on filters and chemical storage tanks.

(For further information on rainbow coatings on equipment contact Graver Water Conditioning Co., A Div. of Graver Tank & Mfg. Co., Inc., Dept. CP, 216 W. 14th St., New York 11, N.Y. . . . or check CP 4185 opposite last page.)

Corrosion-resistant alloy resists 1000°F HCl gas at Ethyl Corp. . . .

gives six years service in one area before maintenance is required

Good service in handling hot hydrogen chloride gas is being given at the tetraethyl lead plant of Ethyl Corporation in Baton Rouge, Louisiana by a corrosion-resistant metal known as Hastelloy alloy B. This material provides an average service life of 30 to 40 times that of conventional metals, while handling the HCl gas, containing water, at 1000°F. In another part of the process, alloy B parts were in use for six years in operation where concentrated H_2SO_4 and HCl were used before maintenance was required.



Equipment made of alloy B atop these chlorine burners gives good service handling HCl at 1000°F

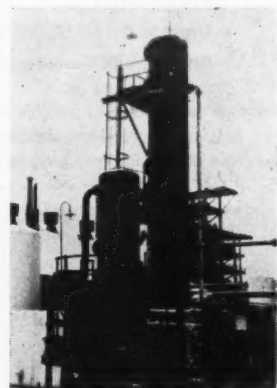
CHEMICAL PROCESSING

At Ethyl Corp. chlorine gas is burned in brick-lined towers at the HCl plant. An alloy B cover is used on top of these towers and a cross made of the same metal is bolted to a hole in the center of the covers. Main stem of cross is six inches in diameter and one side is connected to 4" process flow line through an alloy B plug valve. Process line is made of the same material for a distance of about 10'. Beyond this point gas has been sufficiently cooled to be handled by conventional metals.

Hydrogen chloride gas is piped from burners to two drying towers where the water is removed. Concentrated sulfuric acid is used in this operation. One of drying towers contains four sieve

trays made of Hastelloy alloy B plate perforated with holes. No corrosion can be tolerated near holes since their size is critical.

HCl gas passes up through concentrated sulfuric acid which flows across the tray. Gas pressure drop through holes keeps acid flowing across tray rather than falling through holes. Enlargement of the holes through corrosion would result in acid falling through them and destroying



Six years service was provided by alloy B parts in these two HCl drying towers before maintenance was needed

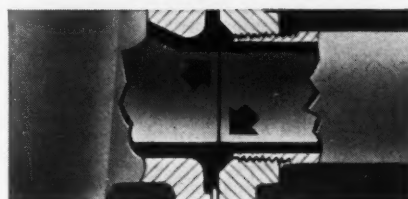
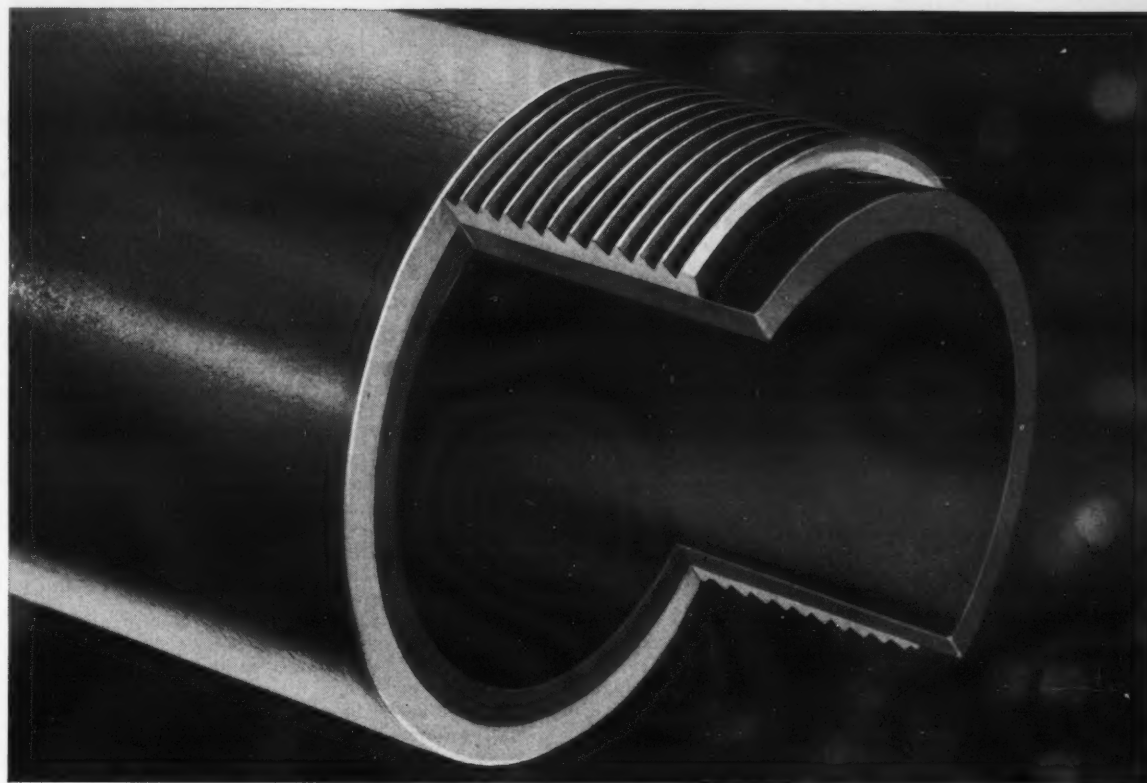
ing drying efficiency. Alloy B retaining grids and lugs are used in other drying tower to support ceramic packing material. No maintenance was required for six years on the alloy B parts in these towers, having been in service since 1949.

(Hastelloy alloy B is product of Haynes Stellite Co., Div., Union Carbide & Carbon Corp., Dept. CP, 30 E. 42nd St., New York 17, N.Y. . . . or for more information check CP 4186 opp. last page.)

Stainless fastening catalog includes 9000 items

More than 9000 items and sizes in different stainless analyses are included in catalog. All pertinent data on each item are included.

Cat on stainless fastenings is issued by Anti-Corrosive Metal Products Co., Inc., Dept. CP, 1210 River Road, Castleton-on-Hudson, N.Y. When inquiring specify CP 4187 on the convenient Reader Service slip which is located opposite last page.



Liquid never touches metal in saran lined pipe even at a flanged connection like this.

You can see why Saran Lined Pipe cuts corrosion costs

It's made of corrosion-resistant saran swaged into rigid non-bursting steel . . . liquid never touches metal in these installations

Here's your best way to convey acids, alkalis and other corrosive liquids—saran lined pipe, fittings, and valves. This modern piping is corrosion resistant . . . forms snug, leakproof joints . . . is available for working pressures up to 150 psi. Fittings and valves are also available in steel for working pressures to 300 psi.

Installation costs are low because saran lined pipe can be cut and threaded in the field with available pipe fitter's tools. Its rigidity means few supporting structures are needed.

Saran lined pipe has an outstanding record of trouble-free performance in many industries. THE DOW CHEMICAL COMPANY, Midland, Michigan.

Saran Lined Pipe Company
2415 Burdette Avenue
Ferndale 20, Michigan
Dept. SP626B

Please send me information on saran lined pipe, fittings and valves.

Name _____ Title _____

Company _____

Address _____

City _____ State _____

Saran Lined Pipe is Manufactured by
The Dow Chemical Company, Midland, Michigan.

you can depend on **DOW PLASTICS**



When inquiring check CP 4188 opposite last page

COROCRETE

A NEW CORROSION-PROOF SURFACING FOR FLOORS

You obtain greater protection...and save dollars...when you specify COROCRETE... the new *acid-proof* floor material developed for diversified applications in the chemical processing, food processing, plating and metal working industries. Quickly and easily applied over existing concrete surfaces, it handles like cement topping. COROCRETE is especially resistant to solvents which destroy conventional floor surfacing materials and expose concrete under-flooring to acid attack. It can be furnished in various grades to resist virtually every type of solvent as well as most acids or alkalis. Thicknesses from 1/4-inch minimum to 1/2-inch maximum (per layer) are recommended for best results. Send coupon today to obtain a sample of COROCRETE and/or a copy of the new technical brochure shown below.

6719-CC

Resists Acids,
Alkalies, Solvents

Resists
Impact

Resists
Abrasion

Sets up Faster
Than Concrete

Costs Less Than
Acid-Proof Brick

4-Times Stronger
Than Concrete

get all the
facts today.

MONOLITHIC
CORROSION-PROOF
FLOORING

COROCRETE

The
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COMPANY

Inc.
4834 Ridge Road
Cleveland 9, Ohio

The Ceilcote Co., Inc.
4834 Ridge Road • Cleveland 9, Ohio
Check one or both:
☐ Please send me a copy of the Brochure.
☐ Please send me a sample of COROCRETE.
Name _____
Address _____
City _____ Zone _____ State _____

CORROSION

**Polyvinyl chloride pipe
available with valves . . .**

suitable for temps to 140°F,
pressures to 125 psi

Line of PVC pipe and fittings has maximum recommended working temperature of 140°F, with maximum working pressure of 125 psi at room temperature. Feature of PVC line will be polyvinyl chloride valves made by Lunkenheimer Company.

Rigid, unplasticized PVC pipe will be available in 10' or custom-ordered 20' lengths of Schedule 80 threaded pipe, with inside diameters ranging from approximately 1/2 to 4".

(PVC pipe line is product of Corning Glass Works, Dept. CP, Corning, N.Y. . . . or for more information check CP 4190 on form opposite last page.)

Describes castable ceramics

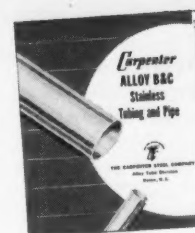
Castable ceramics, which make brazing and soldering automatic in many cases, are described in one-page bulletin.

Bul 102 is issued by Technion Design and Manufacturing Co., Dept. CP, 262 Mott St., New York 12, N. Y. When inquiring check CP 4191 on form opposite last page.

On corrosion-resistant heat exchangers

Cross-bore and cubical corrosion-resistant, impervious-graphite heat exchangers are presented in 12-page catalog. Both exchangers utilize the highly efficient heat transfer design of cross-drilled passages in solid blocks of impervious graphite.

Bul 537 is issued by Falls Industries, Inc., Dept. CP, Aurora Road, Solon, Ohio. When inquiring specify CP 4192 opposite last page.



here's your answer
to **SEVERE
CORROSION
PROBLEMS!**

• This new bulletin gives you complete technical data on Carpenter ALLOYS B and C Tubing and Pipe—two specialty alloys for "super corrosion resistance" to:

- Hydrochloric Acid
- Corrosive Salts
- Phosphoric Acid
- Sulphuric Acid
- Nitric Acid
- Oxidizing Acid Mixtures
- Chlorine and Hypochlorites
- Organic Acids
- Other Strong Corrodents

To help solve your severe corrosion problems . . . get this cost-cutting information on physical properties, corrosion resistance, tolerances and available sizes. Write today for your copy of this bulletin on Carpenter ALLOYS B and C to:

THE CARPENTER STEEL COMPANY
Alloy Tube Division, Union, N. J.

When inquiring check CP 4193 opposite last page



THE OLD WAY

If you handle semi-solids manually, you have a slow, messy procedure. If your material is so heavy it won't pour . . . or if it even stands by itself . . . now you can **pump** it!

PUMP
YOUR HEAVY STUFF
"Direct-from-Drum"

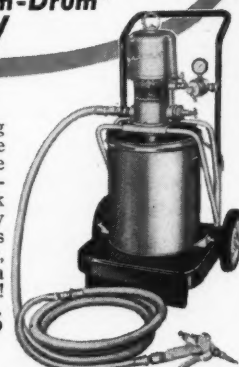
THE New WAY

Now, with Graco's amazing Powerflo pumps, you can apply the economies of pumping to a wide range of heavy, nearly solid materials. Air-operated Powerflos pack tremendous power, mount easily into pails or drums. Powerflo pumps can supply material for extruding, spraying, transferring. Write for a copy of the new Powerflo Catalog!

POWERFLO PUMPS

GRACO

GRAY COMPANY, INC.
Engineers and Manufacturers
32 Graco Square, Minneapolis 13, Minn.



FACTORY BRANCHES
New York (Long Island City)
• Philadelphia • Detroit •
Chicago • Atlanta •
San Francisco

When inquiring check CP 4194 opposite last page

CHEMICAL PROCESSING

Dust-free blast cleaning of metal and concrete results with unit

Recovers abrasive and material removed from surface, eliminating hazardous conditions associated with dust cleaning

Uses: For blast cleaning of metal and concrete surfaces.

Features: Design of unit eliminates dust and hazardous conditions usually associated with blast cleaning.

Description: Design of blast cleaner provides a housing around the area being blasted. Within this housing a suction is created which recovers the abrasive used, and also the material removed from the surface. Abrasive and dust are carried



Removing rust and mill scale from fabricated tank

into the body of the machine. Abrasive returns to feed hopper and dust bag retains the dust. Entire unit weighs only 10 lb and can be easily operated by one man. Swivel blast head permits blasting in all directions. Unit uses air pressure only, no electrical power being required. Variety of common blasting abrasives may be used.

(Educt-O-Matic blast cleaner is product of Clementina, Ltd., Dept. CP, 2277 Jerrold Avenue, San Francisco 24, California . . . or for more information reader may simply check CP 4195 on the convenient Reader Service slip which is located opposite last page.)

Even hard-to-dry, heat-sensitive chemicals are easy to process with **Glascote** conical, rotary DRYER-BLENDEERS

These glass-lined vessels assure freedom from contamination . . . flexibility of use . . . shorter drying cycles . . . uniformity of product . . . elimination of handling and sticking losses

GLASCOTE conical, rotating Dryer-Blenders give you speed, ease and efficiency for drying and blending a broad range of corrosive and heat-sensitive materials, using either steam or hot water.

As the dryer rotates, it imparts a tumbling action that results in continuous, uniform drying and blending of the material. Non-corrosive, glass-lining assures product purity. Ease of handling and non-sticking properties of the glass-lining reduce product losses.

Glascote Dryer-Blenders are ideally suited for handling heat-sensitive materials. By using hot water in the jacket, very low drying temperatures can be obtained. Continuous exposure of new surface shortens drying cycle and prevents over-drying and caking of material.

Standard glass-lined Dryer-Blenders are built in the following capacities — 5 to 35 cu. ft. and larger on request; operating temperatures — liner 500° F, Jacket 650° F; operating pressures — tank full vacuum to 25 psi, jacket 65-75 psi (50-60 psi with tank at full vacuum). Acid or acid-alkali glass-linings are available. Complete specifications available on request.

Our standard one year guarantee continues to apply to all Glascote glass-lined products.

Glascote®

PRODUCTS, INC.

CLEVELAND 17, OHIO

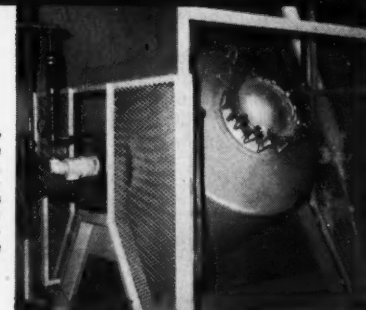
Sales Offices or agents located in

New York • Philadelphia • Union, N. J. • Chicago • Cleveland
Dayton • Houston • Los Angeles • Toronto • Montreal

Export Sales: A. O. Smith Corp., International Division, Milwaukee 1, Wis.



Installed at the Chicago Heights, Ill., plant of the Victor Chemical Company, this Glascote conical, rotary Dryer-Blender makes possible uniform, short-cycle drying of several materials which couldn't be dried in any other way.



Ask the representative who calls on you for all the facts about Glascote products — reactors, receivers, condensers, columns, storage tanks and accessory products. Or, if you prefer, write direct, Glascote Products, Inc., Cleveland 17, a subsidiary of A. O. Smith Corporation.

A subsidiary of A.O. Smith Corporation

World's largest manufacturer of glass-lined steel products



When inquiring check CP 4196 opposite last page

Corrosioneering News

Quick facts about the services and equipment Pfaudler offers to help you reduce corrosion and processing cost.



Published by The Pfaudler Co., Rochester, N.Y.

New trailer-tank saves time and money with liquid transfer

Liquid shipment eliminates drying and packaging, saves the cost and trouble of returning your product to a liquid state upon arrival.

You can now ship, in liquid form, solutions of all acids except hydrofluoric, and all alkalis up to pH 12, to 212° F.

The new Pfaudler glassed steel trailer-tank is delivered complete with signals, reflectors, and hydraulically operated stand wheels to support it independently.

The tank itself is tough Pfaudler glassed steel. This material, besides being especially economical and corrosion resistant, proves ideal for a mobile tank of this type because of its physical strength. In actual demonstrations, a 36" strip of glassed steel can be flexed 6" in either direction without damaging the glass. This is plenty of "give" to absorb the bumps of the road.

The Pfaudler trailer-tank is equipped with sliding hood to protect the vent, manhole and dip pipe at the top. Dip pipe for filling or emptying, glassed both sides and tantalum tipped, reaches down into sump at bottom of tank to assure complete emptying. Tank also has convenient bottom outlet for wash-out.

For additional details, call your Pfaudler representative or send for Data Sheet 29.



Glassed steel trailer-tank is corrosion resistant, permits low-cost shipment of materials in liquid state.

"Performance" takes driver's seat as basis for selecting equipment

Why Pfaudler created new engineering group



John W. Cosier

To simplify selection of equipment that will perform as required to obtain desired yields, Pfaudler has established an Applications Engineering Group.

This section, working with design, development, research and production groups, studies each customer's exact production needs, and selects or designs the proper equipment to match these requirements.

Thus, you have even greater freedom from mechanical restrictions than ever before, since each unit of equipment is carefully chosen to provide the yield you want.

This new group of selected engineers—with extensive backgrounds in chemical production problems—is headed by John W. Cosier.

Pfaudler's Applications Engineering Group has four fields of information at its fingertips:

1. Specialized knowledge of all types of glassed steel, stainless and alloy vessels.
2. Pfaudler's 72 years of experience

in corrosion-resistant equipment.

3. Experimental, test and user data, compiled in Pfaudler's corrosioneering library.

4. Personal experience of each member of the group.

Pfaudler has already had much experience supplying equipment on a performance basis for: absorption, centrifugation, crystallization, distillation, drying, evaporation, liquid extraction, filtration, flow of fluids, leaching, materials handling and mixing. May we help you?



Example of a Pfaudler application and project engineering: The 25 glassed reactors in this large PVC plant are specially equipped for high internal pressures.

New reactor manhole is bigger, handier

Reaction kettles by Pfaudler in larger sizes are now equipped with an 18" diameter round manhole, compared to the old elliptical 12" x 16" opening.

Also, the manhole has been moved nearer the side of the reactor.

This new manhole not only offers a portly portal for hefty chemical workers (up to size 56!) but also provides easier visual inspection and cleaning, and a safer angle for positioning ladders.

For details of this and other design improvements in the new Pfaudler reactors, call your Pfaudler representative or write for Bulletin 926.

PLASTICS: Corrosion resistance and non-adherence of Pfaudler glassed steel reactors are ideal for polymerization. If your product is sticky, corrosive or sensitive to contamination write or wire us for further details on Pfaudler equipment.

CORROSION CONTROL

High chemical resistance furnished by coating for insulation . . .

asphaltic material readily sprayed on surface

Uses: For providing protection to insulations.

Features: When dried and cured, coating offers great resistance to the attack of chemicals common to many industrial operations. Coatings can easily be sprayed on with conventional equipment. Sprayability is virtually unaffected by temperatures between 40 and 140°F.

Description: Coating consists of a protective, asphaltic material of a chemical dispersion type. It is considered superior to "cutback" asphalts which contain flammable solvents as carrying agents, and to water emulsion compositions. It has excellent adhesion when applied to most insulations as well as to metals and other building materials. Coating readily builds up to 1/8" thickness.

Freezing temperatures do not affect coating. It dries to touch in four hours and remains pliable indefinitely. One gallon will provide a dry coating 1/16" thick over an area of 20 square feet.

(Spray-Mastic coating is a product of The Eagle-Picher Co., Dept. CP, 900 American Bldg., Cincinnati 1, Ohio . . . or for more information reader may simply check CP 4198 on convenient form opposite last page.)

Portable electric acid pump is suitable for both open and closed vessels . . .

unit provides maximum safety to operator

Uses: Pump is particularly useful in transferring acids from plating, pickling, or small storage tanks.

Features: Pump can conveniently and safely transfer acids from open vessels as well as from standard carboys and drums. Previous pumps of this type have been limited to use on closed vessels. Pump is completely self-draining. Since no acid remains in pump when it is removed from container, operator safety is increased.

Description: Driven by an entirely enclosed electric motor, pump delivers a steady flow of acid at a rate of approximately six gpm. Lightweight unit is easily positioned and operated by one man. It is available in materials suitable for particular service specified.

(Centri-F pump is product of General Scientific Equipment Co., Dept. CP, 27th and Huntingdon St., Philadelphia 32, Pa. . . or for more information reader may simply check CP 4199 on convenient form opposite last page.)

When inquiring check CP 4197 opposite last page

Galvanizing can be renewed with zinc coating . . .

available for ducts, towers, and equipment not easily dipped

Uses: To provide the protection of metallic zinc to standing structural work.

Features: Zinc coating can be used for renewing galvanizing on parts that have lost original protective coating or for applying zinc protection to standing towers, fences, or air conditioning ducts already in position and not therefore easily coated with zinc by the dipping method of galvanizing.

Description: Coating consists of 95% pure zinc and can be applied with brush or spray gun to structural parts.

(Zinc Shield coating is product of The Wilbur & Williams Company, Dept. CP, 130 Lincoln Street, Boston 35, Mass. Check CP 4200 opp. last page.)

Advantages of aluminum for heat exchangers

One of the advantages for the use of aluminum heat exchangers presented in 16-page bulletin is that aluminum is inert to most of materials commonly encountered in heat transfer applications. Cladding of the material with an aluminum alloy provides additional corrosion resistance for certain applications.

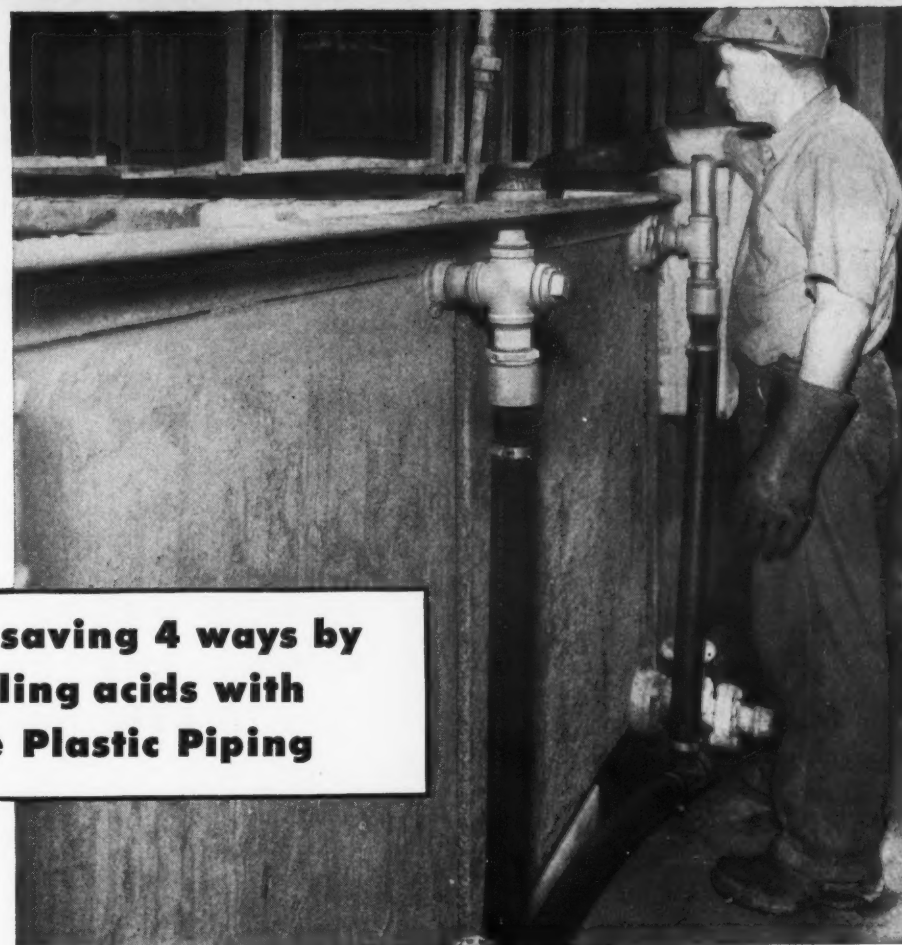
Other advantages obtained when aluminum is used for heat exchangers include high heat transfer rates, good temperature properties, nonfouling, lightness in weight, and low maintenance. Fabrication considerations, mechanical properties, and application information are included in bulletin.

Bul C5-10-1155 is issued by Reynolds Metals Co., Dept. CP, 2500 S. Third St., Louisville, Ky. Specify CP 4201 opposite last page.

Describes anti-corrosive red primer

Photos describing red primer, containing zinc chromate and iron oxide in a chlorinated natural rubber vehicle, are included in folder. One photograph shows how primer was used to prevent corrosion from ferric chloride in one installation. Detailed directions for use are given.

Folder on Rubalt #7C Red Primer is issued by Alfred Hague & Co., Inc., Dept. CP, 227 — 34th St., Brooklyn 32, N.Y. When inquiring specify CP 4202 on form opposite last page.



They're saving 4 ways by handling acids with Crane Plastic Piping

THE CASE HISTORY—Globe-Union Inc., leading storage battery builder, in its Milwaukee plant, might have decided plastic piping wasn't for them and let it go at that. Instead, they gave Crane plastic products a fair trial, and here are the results.

On hydrochloric acid lines to zinc-plating tanks, the metal pipe and fittings formerly used had to be replaced completely about every month. Corrosion was the cause.

With Crane polyethylene pipe and Crane plastic fittings in this same service, after more than 3 months there is no sign of deterioration and no apparent need of early replacement.

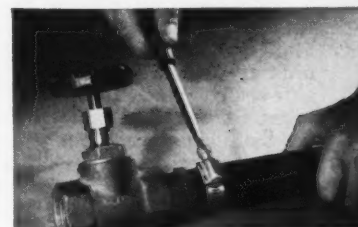
On battery test tanks, Crane

plastic piping, exposed to built-up sulphuric acid concentration, looks good as new after more than 4 months' service.

Savings with Crane plastic piping are adding up 4 ways. Plastic cancels the need for costlier metal pipe. It is installed in a fraction of the time it takes for metal pipe and fittings. It reduces installation to a one-man job with simple hand tools. The longer life of plastic is saving replacement, maintenance and housekeeping costs.

Proved in severest services, Crane plastic piping is giving Globe-Union equal satisfaction on many low-pressure air and water lines. Here freedom from sweating is another advantage of plastic.

Once you know the facts of quality-designed, quality-made Crane polyethylene pipe and Crane plastic insert fittings, you, too, will see many opportunities for saving with this modern piping. Call your local Crane Representative today, or write to address below.



Crane adapter makes plastic-to-metal joints easy

CRANE PLASTIC PIPING

VALVES • FITTINGS • PIPE • KITCHENS • PLUMBING • HEATING

Since 1855—Crane Co., General Offices: Chicago 5, Ill. Branches and Wholesalers Serving All Areas

When inquiring check CP 4203 opposite last page

Virtually Universal Corrosion Resistance* plus Fast, Simplified Assembly

*excluding only hydrofluoric acid and hot caustics



"US" CHEMICAL PORCELAIN with cemented-on ASME 125 lb. standard metal flanges

PIPE
FITTINGS
VALVES
COCKS
POT OUTLETS
JAR OUTLETS
TANK OUTLETS
TOWER OUTLETS
FILTER OUTLETS

Chemically inert, dense, strong and iron-free, "US" Chemical Porcelain Piping and Process Equipment solve the toughest problems in corrosive materials handling, while maintaining absolute purity of solution. When equipped with metal flanges there is an important added advantage — speed and simplicity of installation. Flanges bolt together quickly and easily using ordinary tools . . . forming a strong, rigid, pressure-sealed joint. Down time is held to a minimum. Connections can be made directly to other types of pipe and equipment having ASME standard flanges, adapters are available for connecting to other than ASME standard fittings, but are rarely needed.

Pipe and equipment to which flanges are to be affixed are formed with plain, straight ends and smoothly ground gasket surfaces. Standard flanges are of high grade cast iron, aluminum flanges are also stocked and furnished where specified. Both types comply with ASME standard for number of bolts and size of bolt circles. Extreme care is used in positioning and cementing flanges to assure perfect alignment.

Consider for a minute how your operation can benefit from the outstanding corrosion resistance and iron-free quality of "US" Chemical Porcelain Piping and Equipment . . . and the faster, simpler installation afforded by flanged fittings.



Write for Bulletin
CP-50 and C-5

PROCESS
EQUIPMENT
DIVISION



When inquiring check CP 4204 opposite last page

CORROSION CONTROL

Stainless steel faucet has anti-flash screen in nozzle . . .

fume-tight unit designed for use with volatile and flammable solvents

Uses: For use with volatile and flammable solvents or other hazardous fluids.

Features: Stainless steel faucet has a protective, corrosion-resistant, anti-flash screen in the nozzle. Faucet is manufactured in 304 stainless steel throughout, with chemically-inert Kel-F seal rings.



Metal to metal contact is eliminated in operation of faucet valve

Description: Fume-tight, sanitary faucet permits full flow and has automatic, positive shut-off action which prevents after-drip. Improved safety has been achieved by eliminating metal to metal contact in operation of valve.

(Stainless steel faucet is product of Economy Faucet Co., Dept. CP, 12 New York Ave., Newark 1, N.J. . . . or for more information check CP 4205 on form opposite last page.)

PVC equipment pictured in data sheets

Three data sheets show different applications where rigid polyvinyl chloride can be used to advantage. Photographs are of equipment made from the plastic in actual installation.

Data Sheets 76, 77, and 78 are issued by Quelcor, Inc., Dept. CP, Front & Broomall Streets, Chester, Pa. When inquiring specify CP 4206 on form opposite last page.

For more information on product advertised at right, specify CP 4207 . . . see information request blank opposite last page.



Film censor at work

At 950-acre Kodak Park, the film-producing plant of Eastman Kodak Co. in Rochester, N. Y., they take no chances on film contamination.

For example, in the operation shown here, a red-wheeled Aloyco stainless steel valve rules out of the picture dangerous rust and iron contaminants which would spoil the thick fluid which is called "dope." These valves control the flow of dope onto

roll-coating wheels, where solvents are driven off with heat. The dry film base is then readied for the final coat of emulsion.

Today thousands of industrial processes are being safeguarded by Aloyco corrosion and contaminant resistant valves. Find out why their dependable performance makes them first choice for all types of vital flow lines. Write Alloy Steel Products Co., Inc., 1301 West Elizabeth Avenue, Linden, N. J.



Subsidiary of Walworth Company

**Can you "pay for"
a magazine like this?**

**.....
with a \$3.00 or \$5.00
subscription?**

This magazine costs more than \$40.00 per year

Maybe you've thought publishers make money on a \$3.00 or a \$5.00 subscription ...
that that is why they ask you to subscribe.

No, it's not true ... your \$3.00 or \$5.00 fall far short of "paying" for any really good business magazine.

The costs of printing, paper and postage alone usually exceed subscription prices. Editorial costs and other expenses run to many times that amount. And usually it costs more just to sell such subscriptions than they bring the publisher in dollars. So, the publisher actually "loses money" on such sales.

Then, why? ... yes, why do some publishers charge a nominal rate for a subscription ... but other publishers send their magazines without charge?

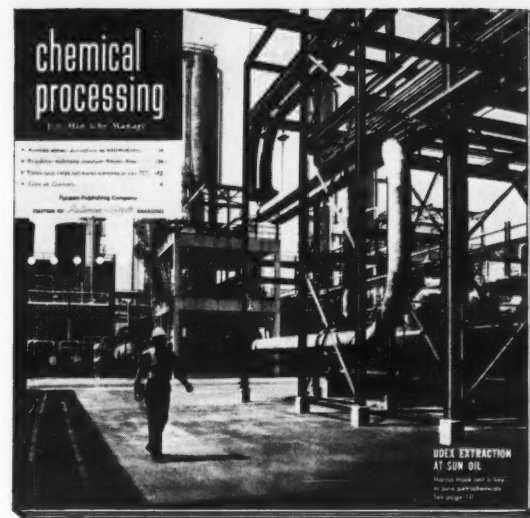
Well, the "paid-subscription" magazine gets a lower postage rate than does the "non-paid subscription" magazine. Some publishers feel this postal advantage is important. So they charge a "token fee" as a subscription price. And so win a lower postage rate.

But—whether you pay nothing, or such a "token fee," you — the reader — do not *really* pay for the magazine's service.

No — advertisers pay the bills ... and so, logically, advertisers demand the best possible coverage of the important, key men of the field. That means folks like you, who exercise buying power.

CHEMICAL PROCESSING "hand-picks" its readers—for best, effective circulation ... and sends the magazine to these key folks, without charge.

You see, you simply can't get maximum coverage of important folks by trying to force them to buy subscriptions. Such men, limited in numbers, are scattered all over the U.S.A.; travel and/or direct mail, cost money; a large share "forget to renew" each year; and, no matter how much time, money, and pressure you put on them, there are always some important men who will never buy.



You don't "pay"—CHEMICAL PROCESSING gets better circulation. So, as you can see, a subscription price is at best but a "token payment." You don't really pay for any magazine with \$3.00 or \$5.00.

But, CHEMICAL PROCESSING gets the best, most effective circulation coverage by "hand-picking" the right readers. This gives values to advertisers which they can't possibly get in any other way.

That's why ... CHEMICAL PROCESSING hand-picks only qualified readers ... Men Who Manage chemical processing plants ... presidents, partners, plant managers, foremen, engineers, chemists, directors of research, etc. Then the editors make the magazine so interesting, so valuable, these folks want to read it.*

That's why CHEMICAL PROCESSING spends many thousands of dollars on each issue — to give you this service costing more than \$40.00 per year ... without charge ... as you are an important reader in the chemical field.

No, you can't "pay for" any good business magazine with \$3.00 or \$5.00. Whether you receive a "paid magazine" or a "non-paid magazine" you are still enjoying a valuable service — whose cost is far above any price you paid for a subscription.

**Every issue proves this qualified readership ... by unequalled response from these key readers. May we show you the evidence?*

Chemical Processing



published by: Putman Publishing Company

also publishers of:
FOOD PROCESSING
FOOD BUSINESS

"Executive Magazines for Industry"



CHEMICAL PROCESSING

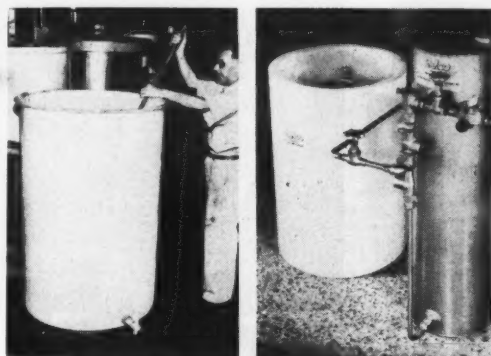
CORROSION CONTROL

Tanks are translucent enough to reveal the level of liquid inside . . .

polyethylene containers molded in one piece to prevent leaks, corrosion

Uses: For mixing, storage, compounding, and processing of chemicals, foods, pharmaceuticals, salts, and water softeners.

Features: Non-breakable walls of tanks are translucent enough to reveal liquid level.



Left photo shows 160 gal polyethylene tank used to mix pharmaceuticals. Outlet valve on this tank is also made of polyethylene. Right photo shows 30 gal tank used for industrial water treatment

Description: Chemical tanks with capacities of 5 up to 160 gal are molded of Bakelite polyethylene in one continuous piece to prevent leaks and corrosion. Tanks can hold caustics, strong or weak acids, and even hydrofluoric acid.

(Chemical tanks are produced by Delaware Barrel & Drum Company, Inc., Dept. CP, PO Box 1648, Wilmington, Del. . . or for more information check CP 4208 on form opposite last page.)



" . . . You mean you spent all day testing this new asphalt and all you can write on the report is 'It's sticky as the devil'?"



Cold flow resistance of TEFLON* and reinforced TEFLON (DUROID 5600) was tested at 700° F., under a torque of 35 pounds and a flange pressure of 1,000 p.s.i. After 2 hours the flanges were cooled and the bolts retightened. The flanges were then exposed to the heat for another 2 hours. Results are as pictured. The gasket of TEFLON (left) extruded extensively on all edges and lost all bolt torque. DUROID 5600 did not extrude and retained 15 pounds bolt torque, demonstrating significantly improved resistance to cold flow.

ROGERS REINFORCES "TEFLON" TO REDUCE ITS COLD FLOW

Rogers DUROID 5600 is a combination of TEFLON and inert fibers, blended into an homogeneous sheet material. This new material is not a replacement or a substitute for TEFLON, but rather an extension of it. TEFLON has better electrical characteristics and dry lubricating qualities. DUROID 5600, however, has much of TEFLON'S resistance to chemicals, and is greatly superior to TEFLON in resistance to cold flow and heat distortion.

*Registered trademark of DuPont Company for its tetrafluoroethylene resin.

ROGERS CORPORATION

ROGERS, CONNECTICUT

PRODUCTS

DUROIDS—for Gaskets, Filters, Electronic Devices, etc. ELECTRICAL INSULATION—for Motors, Transformers, Generators, etc.
SHOE MATERIALS—for Counters, Midsoles, Liners, etc. PLASTICS—Special Purpose Molding Compounds and Laminates.

SERVICES

FABRICATING—including Combining, Coating, and Embossing. DEVELOPMENT—Research and Engineering of New Materials, Parts, and Products.

When inquiring check CP 4209 opposite last page

Greater Resistance to Heat Distortion



TEFLON (left) distorted badly when subjected to 720° F. and then cooled. Reinforced TEFLON (DUROID 5600) exposed simultaneously to the same temperature retained flatness, demonstrating greater dimensional stability at high temperatures.

SOME IMPORTANT TEST VALUES

Tensile Strength, MD, psi	2500
Tensile Strength, CMD, psi	1500
Compressibility, 5000 psi, %	8
Thermal Expansion Coefficient per °F., 73-140°F.	2.7 x 10 ⁻⁵
Heat Distortion Temperature, °F.	
66 psi	500+
264 psi	500+
Deformation under Load, %	
1200 psi	2*
2000 psi	3*
Coefficient of friction against polished steel, static	.21
kinetic	.14
Specific Gravity	1.90

*Made up of actual flow and also of compression under load. Data to indicate breakdown between these two portions is being obtained.

Please write

Dept. C

for Technical Bulletin



For Every Corrosive Service



FreeFlow GASKETS made of TEFLON*

"John Crane's" FreeFlow construction and chemically inert Teflon have been combined as the answer for gaskets in corrosive service. This new construction assures a flush fitting with the I.D. of the pipe and the inner wall of the Teflon envelope, not possible with the ordinary "wishbone" type gasket. (See drawing above).

This means elimination of:

1. Flow restriction and turbulence in the line.
2. Danger of rupture at high temperature due to entrapped air between gasket insert and Teflon envelope.

"John Crane" Teflon FreeFlow gaskets are impervious to practically every known chemical or gas and are unaffected by temperatures from -100° to $+482^{\circ}\text{F}$., depending on the insert material. They are available in all shapes and sizes for a wide variety of applications, such as glass lined, porcelain, pyrex and similar equipment, including reactor kettles and pipes, distillation columns and nozzles.

Request full information on "John Crane" FreeFlow gaskets for your particular requirement. Ask for our informative booklet, *The Best in Teflon*, for other important technical and application data. Crane Packing Company, 6421 Oakton St., Morton Grove, Ill. (Chicago Suburb).

In Canada: Crane Packing Co., Ltd., Hamilton, Ont.



* DuPont trademark

JOHN CRANE CRANE PACKING COMPANY 38 YEARS INDUSTRIAL PROGRESS

When inquiring check CP 4210 opposite last page

CORROSION CONTROL

Armor protects glass pipe from rough handling . . .

covering carries same work load as pipe in case of glass failure

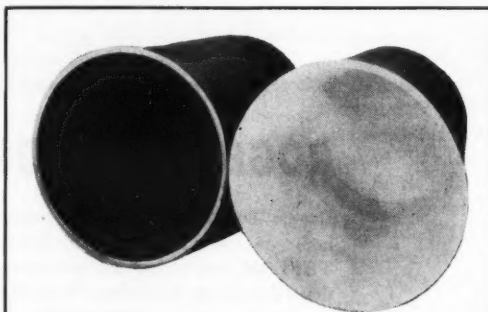
Protection is provided to Pyrex brand glass pipe by seamless sleeve of Fiberglas, fitted over the pipe and impregnated with polyester. Sleeve carries the same rated load as the glass pipe.



Armor for glass pipe allows sufficient visibility to determine liquid levels in pipe

Jacket is non-flammable and is cut to fit the length of the pipe. It is corrosion-resistant, unaffected by weather, moisture, or rodents, and has a maximum operating temperature of 300°F . Armor is only $1/16''$ thick and allows sufficient visibility to determine liquid levels in the pipe.

(Pyrex-brand armored glass pipe is product of Corning Glass Works, Dept. CP, Corning, N.Y. Check CP 4211 opposite last page.)



Plastic-coated Storage Tanks

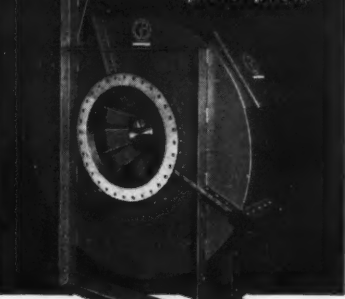
Shown here in right photo is a chemical storage tank coated with an unbaked dispersion of a fluorocarbon plastic coating based on Kel-F dispersions. Left photo shows a tank after the applied coating has been fused to a homogeneous impermeable film. Baking produces a tough adherent continuous coating with excellent chemical resistance at temperatures approaching 400°F on tanks up to 1000 gal capacity.

(Kel-F dispersions are a product of The M. W. Kellogg Co., Dept. CP, PO Box 469, Jersey City, N. J. . . . or check CP 4212)

(Application was by Metal Cladding Inc., Dept. CP, North Tonawanda, N.Y. . . . or check CP 4213)

How is your Corrosion Resistance?

If your problem is moving corrosive agents thru a blower system, General's stainless steel neoprene or chemical coated construction is the right prescription.



General designed Pressure Blower, 35" static pressure with capacity of 10,000 CFM.

Blower failures, occurring within 6 months to two year periods, prompted Liquid Carbonic Corporation's Cincinnati plant to install this General Blower design. The blower is designed to handle highly corrosive flu gases. After 5 years of service, the fans are unaffected. Similar installations have since been made in other Liquid Carbonic plants. We invite you to consult with our engineering department if your problem is moving air, heat, gases, or materials.



GENERAL BLOWER

COMPANY

LUNGS FOR INDUSTRY

DESIGNERS • ENGINEERS • MANUFACTURERS OF FANS, BLOWERS, EXHAUSTERS AND RELATED INDUSTRIAL EQUIPMENT

8605 FERRIS AVENUE • MORTON GROVE, ILL.

When inquiring check CP 4214 opposite last page

CHEMICAL PROCESSING

***Iolyte* LAMINATED FIBERGLASS FOR CORROSION RESISTANCE**



***Iolyte* TANKS** Fabricated to your Specifications

NO MOLDS NEEDED—Made any size, any shape, at no extra cost and no loss of delivery time.

UNIFORM DIMENSIONS — NO TAPERING—Dimensions are same at bottom and top . . . means larger capacities than tapered molded tanks.

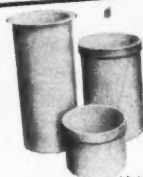
FLANGES, DAMS, Etc.—Can be inexpensively equipped with flanged connection, holes, overflow dams, baffles, separations, etc.

CHEMICALLY RESISTANT THROUGHOUT—Fabricated from *Iolyte* sheet properly reinforced. This is a structural material . . . not a lining.

Write for literature, prices, and table of chemical resistance for *Iolyte* tanks, cracks, ducts.

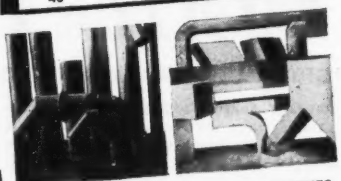
***Iolyte* CROCKS**

Available
from Stock



PRICE LIST

Gal. Cap.	Outs. Diam.	Outs. Hght.	List Cost	Gal. Cap.	Outs. Diam.	Outs. Hght.	List Cost
5	9"	18"	18.00	14	18"	12"	35.00
5	10"	18"	18.00	20	18"	18"	40.00
8	12"	16"	22.00	26	18"	24"	45.00
10	12"	20"	24.00	30	18"	28"	49.00
12	12"	24"	26.00	40	18"	36"	59.00
9	10"	24"	21.00	50	18"	48"	69.00
7	9"	24"	20.00	27	22"	20"	53.00
10	16"	12"	26.00	30	22"	36"	70.00
12	16"	14"	28.00	35	22"	48"	83.00
15	16"	18"	33.00	73	28"	22"	76.00
20	16"	24"	40.00	95	28"	36"	98.00
30	16"	36"	49.00	125	28"	48"	125.00
40	16"	48"	59.00				



***Iolyte* DUCTS**

ANY DIMENSIONS ANY CURVES ANY LENGTHS

Iolyte has greater resistance to chemical attack than stainless, Monel, or aluminum. 1/5 the weight of steel, it is superior in tension, flexural, and compression strength. Unlike thermoplastics *Iolyte* will not heat-distort below 350 deg.

Send drawings or prints for quotes and ask for literature giving chemical resistances.

Order from us or your distributor. Unless rated firm, payment with order. No COD's.

ALL PRICES F.O.B. FACTORY

SCHORI PROCESS DIVISION

FERRO CO CORPORATION

8-10 43rd ROAD, LONG ISLAND CITY 1, N. Y.
FACTORY: 59-31 54th STREET, MASPETH, L.I.

CORROSION

**Paste laminating resin
provides corrosion
resistance . . .**

material suitable for surfaces
of industrial structures

Uses: For preparing corrosion-resistant surfaces on industrial structures; in laminating glass fiber jigs and fixtures; and in surfacing wood, metal, and concrete storage tanks.

Features: Material provides excellent corrosion resistance. Although the filler present is relatively small, paste exhibits unusual thixotropic properties, particularly its ability to cling on vertical walls and ceilings without sagging or dripping.

Description: In application, hardener is mixed with paste laminating resin. This is brushed on surfaces to be protected and then glass cloth is pressed into place roughly by hand, followed in turn by squeegee or roller applicator. Material rapidly penetrates and thoroughly wets the glass fabric.

(Epocast 2 C laminating resin is product of Furane Plastics, Incorporated, Dept. CP, 4516 Brazil St., Los Angeles, California. . . or for more information concerning manufacturer's product, reader may simply check CP 4216 on form opposite last page.)

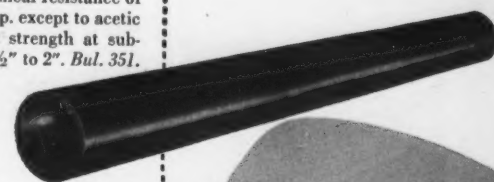
Technical instructions for nickel plating

Nickel-plating process which can produce nickel deposits with considerable variations of stress, hardness, tensile strength, elongation, ductility, and electrical resistivity is described in 16-page bulletin. Eight micro-photographs compare metal deposits under different plating conditions.

Bul 5358 is issued by Hanson-Van Winkle-Munning Co., Dept. CP, Matawan, N.J. When inquiring specify CP 4217 on form which is located opposite last page.

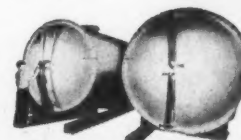
STAYS TOUGH AT SUB-ZERO TEMPERATURES

ACE PARIAN . . . odorless, tasteless, rigid polyethylene. Best chemical resistance of any plastic at room temp. except to acetic acid. Excellent impact strength at sub-zero temp. Rigid pipe 1/2" to 2". Bul. 351.



LIFE-TIME

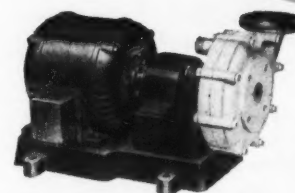
ACID STORAGE TANKS
Rubber-lined by ACE
2-layer system



Economical, universal protection against all alkalis, metallic salts, practically all inorganic acids, hydrochloric acid any strength, sulphuric to 50%, nitric to 20%, phosphoric to 75%. Good to 160 deg. F. . . . sometimes higher. Soft rubber interlayer aids shock resistance.

Now eleven ACE Materials to STOP CORROSION

Eleven job-proved rubber and plastic materials now available in ACE piping, valves, pumps and tanks. Tough Ace-lite rubber-plastic blend . . . heat-resistant Tempron . . . Saran . . . many others. Write for comparative properties Bulletin CE-50 . . . or call your American Hard Rubber Company distributor.



ACE "WAM" . . . THE FINEST
Non-metallic Acid Pump

On job after job, this 80-gpm. centrifugal pump has earned highest praise. Hard rubber casing and impeller, Hastelloy C shaft. Handles nearly all corrosives. Mechanically simple, trouble-free. Bulletin CE-55. Larger Ace pumps available.

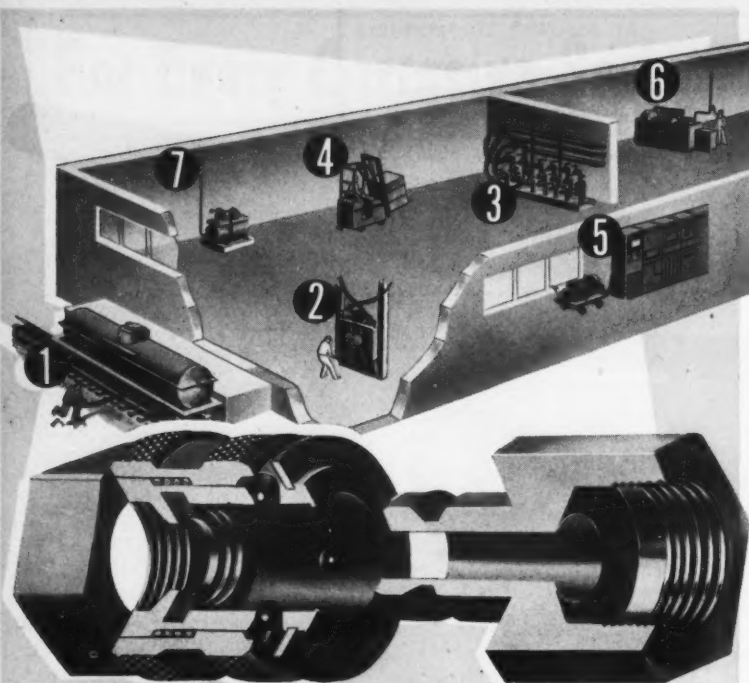


NEED SPECIAL FITTINGS,
COVERS, TANKS, PARTS?

If you want life-time corrosion protection for special parts needed in quantity . . . we may save for you by molding them of ACE hard rubber or plastics to your most exacting requirements. Our facilities among world's largest. Ask for recommendations.

ACE processing equipment of rubber and plastics

AMERICAN HARD RUBBER COMPANY
93 WORTH STREET • NEW YORK 13, N. Y.



whatever the operation . . .

Titeflex Quick-Seal Couplings for fast, leakproof connections!

Everywhere in industrial operations, you find Titeflex Quick-Seal Couplings "making connections"! And what connections! *Absolutely* leakproof. Couple or uncouple in *one second*. Allow free flow of *any* material. Sizes $\frac{1}{4}$ " to 12".

See drawing for typical uses. Then check your own plant for trouble spots where Quick-Seal Couplings can serve you profitably. For details . . . send coupon.

- | | |
|-------------------------------|----------------------------|
| ① Tank Car Unloading | ⑤ Mobile Testing Equipment |
| ② Furnace Doors | ⑥ Machine Cleaning |
| ③ Blending "Switchboards" | ⑦ Air Lines for Tools |
| ④ Lift Trucks—Hydraulic Lines | |

Titeflex

TITEFLEX, INC. (Industrial Products Div.)
509 Hendee Street, Springfield, Mass.

Send me your free Quick-Seal Couplings Catalog—don't obligate me.

Name _____ Title _____

Firm _____

Address _____

City _____ Zone _____ State _____

Titeflex Quick-Seal Couplings • Leakproof at all operating pressures, in every application

When inquiring check CP 4219 opposite last page

CORROSION

Planning protective coating systems

Two illustrated catalogs describe protective coating systems which can incorporate corrosion resistance into a project by planning for their use prior to construction. One catalog is for the industrial construction field and the other for plant maintenance engineers. Various corrosion-resistant coating systems are outlined, and information given for choosing the proper protective coating for a particular application.

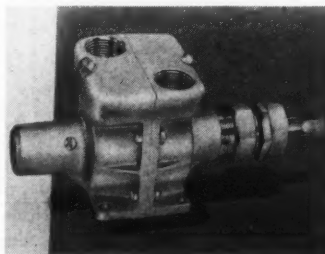
Catalogs 3i and 3j are issued by Amercoat Corp., Dept. CP, 4809 Firestone Blvd., South Gate, Calif. When inquiring specify CP 4220 opp. last page.

Choice of impellers — neoprene, Teflon, or Formica . . .

positive displacement pump
gives non-foaming delivery

Uses: Pumping of hazardous or sensitive fluids, emulsions, and solutions at elevated temperatures.

Features: Positive displacement pump, available now in Type 20 stainless steel and Has-



Additional ports may be specified for special requirements

telloy C, can be supplied with Teflon, neoprene, or Formica impellers to broaden corrosive service.

Description: Design of unit provides linear flow characteristics to allow non-foaming and non-turbulent delivery of hazardous or sensitive fluids, emulsions,



Tygon Plastic Gasketing is highly resistant to acids and alkalis. It is tough, resilient and non-aging; resists wear and abrasion. Cut your own from sheets, tubing or solid cord . . . or we will provide molded gaskets, grommets or seals to your specifications.

WRITE FOR
BULLETIN
G-520

214-E



When inquiring check CP 4221 opposite last page

PROTECT against CORROSION with ATLAS

RIGID PLASTIC FABRICATIONS

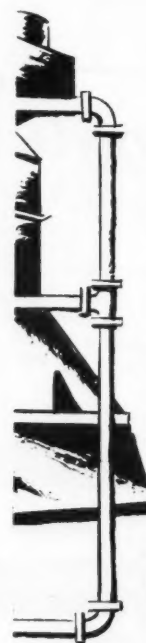
Complete fume exhaust systems, processing tanks and equipment can be fabricated to meet your specifications. Resistant to a wide range of processing chemicals.

RIGID PLASTIC PIPING

Pipe extruded in i. p. s. sizes from $\frac{1}{2}$ " to 6" to convey corrosives to and from processing equipment. A complete stock of flanges, valves and fittings in all standard sizes.

Write for Bulletin 9-2 on
Atlas Rigid Plastics

A complete corrosion service for the chemical industry.



SERVING
INDUSTRY
SINCE
1892



Technical Representatives throughout the U. S.

When inquiring check CP 4222 opposite last page

CHEMICAL PROCESSING

Are you missing the corrosion resistance of PYREX® pipe because you think it will break?

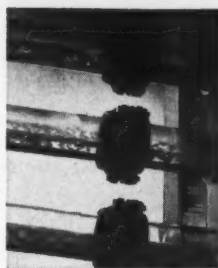
A plant manager says this about PYREX pipe: "There was no breakage during installation. There have been no lines broken because of the product handled, the temperature involved, or the age of the pipe. In short—there has been no breakage."

Product lines in this plant have been PYREX since 1943. Before the company switched, corrosion in the metal lines made cleaning difficult, frequent replacement made maintenance costly.

Engineers and operating men in hundreds of plants are running hard-to-handle fluids like sulfuric, hydrochloric, nitric and acetic acids; chlorinated hydrocarbons, hydrogen peroxide, bromine, brines and low concentration alkali solutions through their PYREX pipelines with no problems whatsoever.

Your own pipe fitters can install PYREX pipe. It's easy to clean. Maintenance is practically nil. It's durable and costs about the same initially as other corrosion resistant piping. But even if it should cost more than the piping you now use, PYREX pipe would quickly make up the difference in low installation cost, low maintenance cost, long service.

Make this check—Probably plants near you use PYREX pipe, know its value in terms of personal experience. We'd like to send you their names so you can talk to people who use glass pipe daily. Ask for a list. Use this publication's reader service for added information.



CORNING GLASS WORKS

CORNING, N.Y.

Corning means research in Glass

When inquiring check CP 4223 opposite last page

A Complete Line of Corrosion-Resisting Fittings!

INCO-CAST in Monel®, Nickel and Inconel®

They Offer You

All these features

- Resist most corrosives
- Withstand high and sub-zero temperatures
- Strong . . . tough . . . sound
- Protect product purity
- Controlled alloy composition
- Pressure-tested
- Economical in cost
- Threaded and welding types

- Fast service on rated orders to all points from conveniently located distributors' stocks

—in all these types

Couplings
45° Elbows
90° Elbows
Tees
Crosses
Unions
Caps
Pipe Plugs
90° Street Elbows
Lock Nuts
Bushings
"Y" Laterals
Half Couplings
Close Nipples
Flanges
45° Flanged Elbows
90° Flanged Elbows
Flanged Tees
Short Nipples
Reducing Couplings
Reducing Tees
Reducing Elbows
Welding Nipples
Return Bends
... and others

PLUS

Special shapes and sizes made to order

THE INTERNATIONAL NICKEL COMPANY, INC.
67 Wall Street, New York 5, N. Y.



WRITE NOW

for handy price list catalog. It contains full information. Sent promptly on request, without cost or obligation to you.

When inquiring check CP 4224 opposite last page

CORROSION

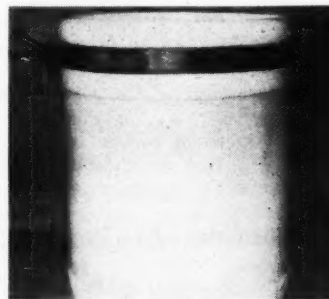
and solutions. Pumps are supplied in two models with capacity ranges to 3.5 gpm and 10 gpm at 1750 rpm respectively. They are regularly fitted with two ports but may be specified with two additional ports to meet special requirements.

(Eco All-Chem positive displacement pumps are a product of Eco Engineering Co., Dept. CP, 12 New York Ave., Newark 1, N.J. . . . or check CP 4225 opposite last page.)

Large polyethylene tank equipped with handles . . .

unit used for hydrochloric and diazot solutions

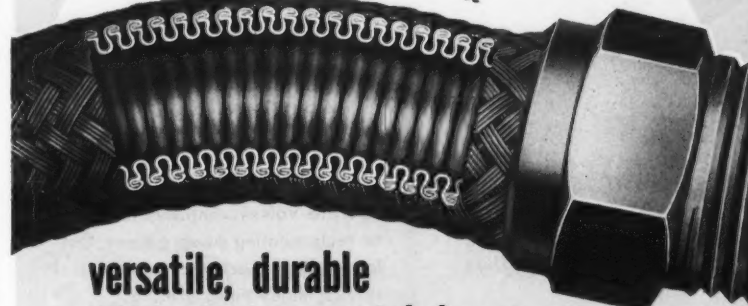
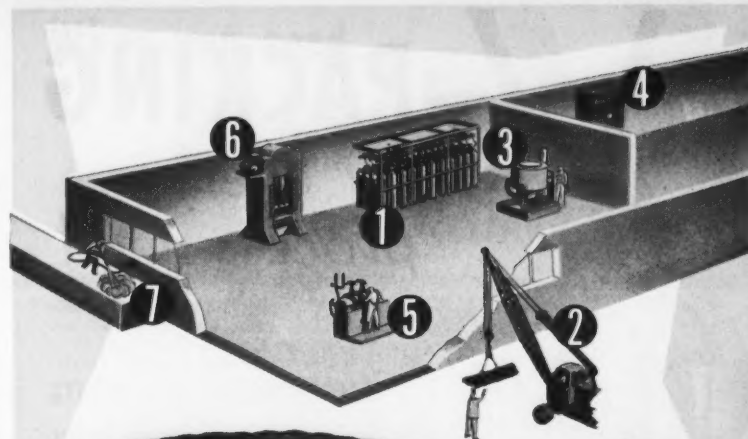
Designed to answer the need for large gallonage containers with suitable handles for transporting the vessel when filled, a 40 gal cylindrical tank has been developed. Since tank is made of polyethylene, it is corrosion resistant.



Corrosion-resistant plastic tank has 40 gal capacity

It is being used to handle hydrochloric and diazot solution. Tank, which is 26" high, was made by centrifugally casting polyethylene to form the shell. To make the container transportable, a 1" thick by 2" wide hot-rolled steel flat band was formed and steel handles welded to it. Band and handles were then fitted to tank after spraying with polyethylene.

(Polyethylene tanks are a product of American Agile Corp., Dept. CP, PO Box 168, Bedford, O. Check CP 4226 opp. last pg.)



versatile, durable Titeflex metal hose . . . for every type of processing operation

Can take grueling punishment from corrosive fluids, high temperatures, excessive vibration and pressures . . . or from any combination of these industrial *spoilers*. All-metal construction. Wide range of sizes. Braided or unbraided. Choice of alloys and fittings to meet *every* need.

Titeflex Metal Hose finds many important jobs *everywhere*. Investigate your processing operations now and see where Titeflex Flexible Metal Hose can work for you. Send in coupon for important additional information *today*.

- | | |
|--------------------------|-------------------------------------|
| ① Fire Extinguisher | ⑤ Milling Machine |
| ② Air Control Lines | ⑥ Hydraulic Press—Lubricating Lines |
| ③ Cleaning Vats | ⑦ Steam Lines |
| ④ Air Conditioning Units | |

Titeflex

TITEFLEX, INC. (Industrial Products Div.)

509 Hendee Street, Springfield, Mass.

Send me your free Titeflex Flexible Hose Catalog without obligating me.

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Firm _____

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TITEFLEX FLEXIBLE METAL HOSE licks

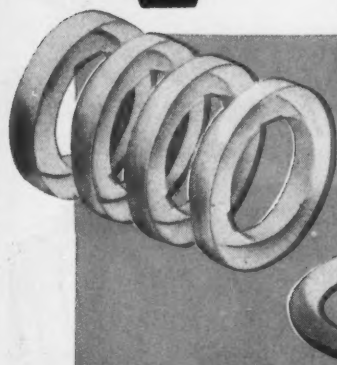
corrosion
temperature
vibration
pressure

in **all** industrial
operations

When inquiring check CP 4227 opposite last page

V-PACKING

for every
process need



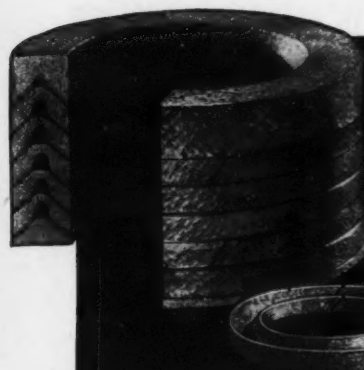
TEFLON... CHEMISEAL PACKING

Chemiseal V-Rings are all TEFLON, all low-friction, all-chemical resistant. Distinctive tapered V design offers greater flexibility and resiliency. Provides necessary seal at low gland pressure, reducing torque required to

Write for U. S. Gasket Catalog TP-1255 on Engineered Teflon Packings.

*In Print Trademark

operate valves—imposes less load on reciprocating pump pistons. Outlasts other packings in chemical service, many times over.



BEL-VEE GENERAL PURPOSE PACKING

The "Pressure-Sealing" V-Ring packing that expands toward rod and stuffing box wall on pressure stroke to automatically form the seal—and relaxes when pressure is released to allow free movement with minimum friction.

For all reciprocating rods and valve stems handling water, oil, solvents, steam, air and gas.

Write for Belmont Catalog 4-R-10 on Self-Sealing V-Ring Packings.



United States Gasket Co.
Camden 1, New Jersey

The Belmont Packing & Rubber Co.
Butler & Sepviva Sts., Phila. 37, Pa.

U.S. GASKET • BELMONT PACKING

When inquiring check CP 4228 opposite last page

Recent Books



Handbook of Insecticide Dust Diluents and Carriers

(Staff Review)

About 200 dust diluents and carriers for insecticides are described in 234-page handbook. The authors, Watkins, Norton, Weidhaas, and Brann of Cornell University, have classified these materials and given their trade name, producer, chemical and mineral analysis, location of mine, packaging and processing information, color, and particle size and shape.

To obtain "Handbook of Insecticide Dust Diluents and Carriers, Second Edition" remit \$4.75 direct to Dorland Books, Dept. CP, PO Box 31, Caldwell, N.J. When inquiring specify CP 4229 on form opposite last page.

Chemistry of Carbon Compounds

Reviewed by D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

Competently edited by E. H. Rodd, Volume III-A of "Chemistry of Carbon Compounds" deals with aromatics in chapters devoted to mononuclear hydrocarbons; halogen-, nitro-, nitroso-, and hydroxylamino-derivative of benzene and its homologs; aromatic amines; sulfonic acids; and sulfonyl compounds; nitrogen derivatives of anilines; aromatic metal and metalloid compounds; nuclear-hydroxy derivatives and phenols; alkylamines; alcohols, aldehydes, and ketones of the benzene series and monocarboxylic acids of the benzene series.

This 685-page book is characterized by a

wealth of information on the properties of a host of compounds and by procedures for their preparation. Throughout, documentation is unusually complete, frequent use is made of structural formulas, and style is terse. An 83-page index, two pages of addenda and corrigenda for Volume II-B, and lists of periodicals and abbreviations add value to the project.

To obtain "Chemistry of Carbon Compounds, Vol. III-A" remit \$17.50 direct to the Elsevier Press, Inc., Dept. CP, 402 Lovett Blvd., Houston, Tex. When inquiring specify CP 4230 on form opposite last page.

Handbook of Engineering Materials

(Staff Review)

This one handbook presents comprehensive data on properties of engineering materials so that the engineer working with many materials need not refer to numerous specialized handbooks for each subject. In this way, he can readily compare all principal factors in selecting a particular material. The editors list these factors as the properties of the materials, their ease of fabrication, availability, and cost.

The 1382-page handbook is divided into four main sections: the first (126 pages) presents information on specs and standards, statistics of sampling, conversion and constants tables, and formulas. Second section (580 pages) covers ferrous metals, aluminum, magnesium, copper and alloys, zinc, nickel and alloys, other pure metals, and special-purpose metals and alloys. The data range from phase diagrams to tables of standard structural sizes.

Section three (502 pages) gives details on non-metals: wood, paper, fiber, plastics and

**reviews of current technical and reference works
... summarized for you by authorities in the field
working with the CP staff**

rubbers, surface coatings, ceramics, industrial chemicals, and lubricants. The fourth section (156 pages) presents materials of civil construction: timber, foundations, cements, roadbed materials, and glass products. A section devoted to weather and moisture protection is included here.

Editors are Douglas F. Miner and John B. Seastone. Dr. Miner is director of the division of student personnel and welfare at Carnegie Institute of Technology in Pittsburgh. He was formerly with Westinghouse Electric Corporation. Mr. Seastone is manager of research, development, and engineering for the Metals Division of Olin Mathieson Chemical Corporation. Previous to this, he was also with Westinghouse.

To obtain "Handbook of Engineering Materials," remit \$17.50 direct to John Wiley & Sons, Inc., Dept. CP, 440 Fourth Ave., New York 16, N.Y. When inquiring specify CP 4231 on form opposite last page.

Introduction to Chemical Engineering

(Staff Review)

"Introduction to Chemical Engineering" by Walter L. Badger and Julius T. Banchero, is a 753-page book designed for beginners. As the authors point out, it is not intended for advanced students and it does not give an all-inclusive treatment of the subjects selected. Practicing engineers who read this book will find that their specialty is not fully covered.

For students encountering unit operations for the first time, the book definitely fulfills its purpose. It should also serve as a reference of basic fundamentals for the graduate engineer. A good balance is maintained between theory and engineering applica-

tions. Unit operations are presented in logical order and theory is developed without gaps.

Illustrations have all been specially drawn for the book. There are 418 figures. Equipment illustrations are line drawings of actual machines, not just diagrams.

To obtain "Introduction to Chemical Engineering," remit \$9.50 direct to McGraw-Hill Book Co., Inc., 330 West 42nd Street, New York 36, New York.

Instruments

For Measurement and Control

(Staff Review)

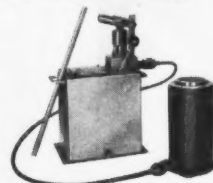
This is an excellent, practical book for the instrument man who wants to check details of recent developments as well as the instrument maintenance man or practical instrument student looking for useful information. It is not a book of theory — there is no calculus and only the most practical problems are treated mathematically.

Arrangement of the book alone points to its practical approach. Chapters are accorded temperature, pressure, flow, level . . . and less commonly analyzed variables such as humidity and moisture, analysis, time function control. In each case available instruments, from old standbys to the most recently announced types, are described and compared. While treatment is not mathematical, it does justice to intricate relations involved in measuring and controlling.

To obtain "Instruments for Measurement and Control," By Werner G. Holzbock, (371 pages) remit \$10 direct to Reinhold Publishing Corp., 430 Park Ave., New York 22, N.Y.

When you need PRESSURE call Watson-Stillman

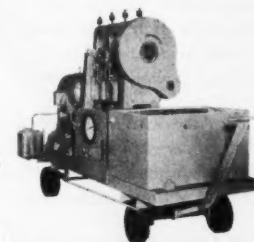
HAND PUMPS AND JACKS — Single and double plunger pumps for 3,000, 6,000 and 10,000 psi mounted on small, medium and large tanks. Jacks range in capacities from 20 to 500 tons in a variation of lifts and ram sizes.



INTENSIFIERS — Plain type intensifiers in standard and special designs.



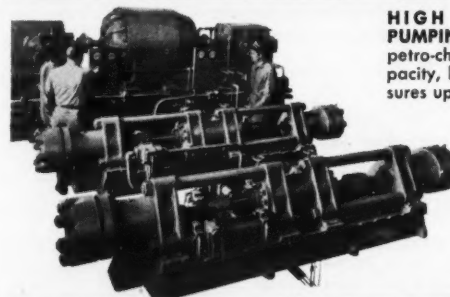
HIGH PRESSURE PUMPS — Medium and heavy duty to suit a broad range of operating conditions.



ACCUMULATORS — Hydro-pneumatic type high pressure and high and low pressure systems. Other types are plain, variable, tank and bottle type.



HIGH PRESSURE INTENSIFIER PUMPING UNIT designed for use in the petro-chemical industry. This high capacity, low speed unit operates at pressures up to 100,000 psi.



When you need standard or special hydraulic equipment for pressure testing, research, development or production, call *hydraulic machine headquarters* — Watson-Stillman. We have specialized in solving pressure problems for more than a century. This experience is at your service.

WATSON-STILLMAN PRESS DIVISION

FARREL-BIRMINGHAM COMPANY, INC.
190 Aldene Road, Roselle, New Jersey



WS-5

When inquiring check CP 4232 opposite last page



The adjustable-speed wedgbelt drive is a Combination...

... of American Wedg-Tite Companion Sheaves, precision-matched to the same taper of the bushing, the exact sidewall angle of the belt. Machined to a satin finish, with accurate balance and concentricity, they lower frictional power-loss, increase plant efficiency.

... of American Wedg-Tite Bushings with exclusive *steeper taper* for fast installation and easy removal, uniform compression, positive alignment, and maximum clamping action on the shaft.

... of American Wedgbelts, mold-cured to vary less than $\frac{1}{4}$ of 1% in length, with strict uniformity in taper, thickness and width. Dacron* cords in Super-Service Wedgbelts are $2\frac{1}{2}$ times stronger than rayon, withstand shock loads and high starting torques.



... of American Adjustable-Diameter Sheaves, allowing stepless speed variation by internal change of pitch diameter of the sheave. Simultaneous flange movement keeps belt alignment constant. Exclusive *double-taper* hub locks flanges in position, locks sheave tight to shaft... assures positive speed control.

THE RIGHT COMBINATION FOR MAXIMUM VARIATION OF MACHINE SPEEDS

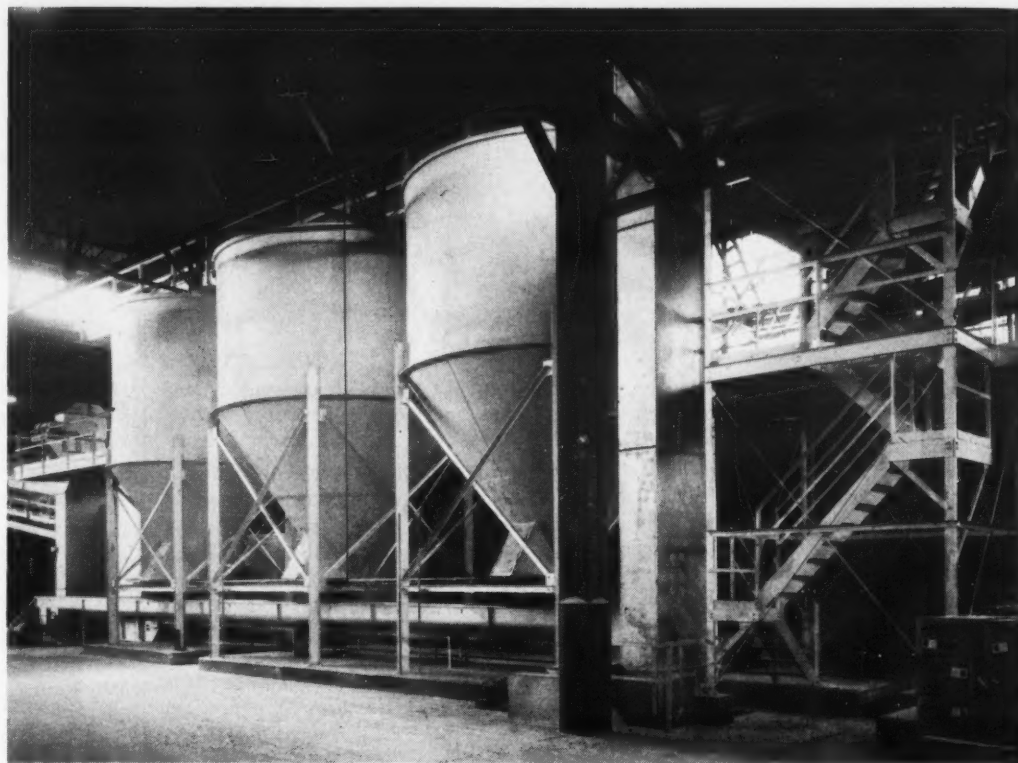
*Reg. TM, E. I. DuPont de Nemours & Co., Inc.

The American Pulley Company

4222 Wissahickon Avenue
Philadelphia 29, Pa.

When inquiring check CP 4233 opposite last page

material handling



Incorporating such features as automatic weighing, complete interlock of conveyor and weighing systems, intermediate storage of product and remote control of entire operation, National Sugar's bulk handling system...

***moves half-million pounds
in one shift—
with one man***

With a capacity of 250 tons of sugar per shift, National Sugar Refining Company's Long Island City warehouse is under the control of one man at a panel board. Three grades of sugar can be received, shifted or taken out of storage without contamination. While system has two loading stations, network is arranged so that all lines lead to a single scale. After weighing, product may be directed to either loading point at the election of the operator.

How The System Works

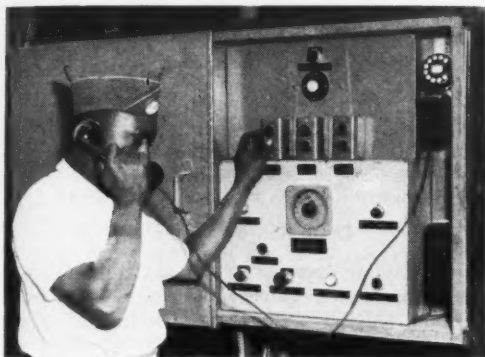
Sugar is received from storage tanks in refinery across the street from warehouse on a 16" rubber conveyor belt. Belt discharges into weighing hoppers above 600 pound capacity scale. Hopper holds material for about $2\frac{1}{2}$ weighings.

After weighing, sugar is dropped into a bottom hopper, holding about $1\frac{1}{2}$ weighings. Hopper dis-

CHEMICAL PROCESSING

Conveyors below intermediate storage tanks receive product, deliver it to bucket elevator for recycling to scale

Operator controls and observes entire system from panel board



charges onto rubber belt, carrying product to a screw conveyor on building's roof and then to a 10" screw conveyor inside the warehouse. This last screw has three take-off points, where material is picked up by three smaller screws for delivery to railroad hopper cars at end of the building. Sheltered by a plastic canopy, hoppers may be loaded in any weather.

(Please turn to next page)

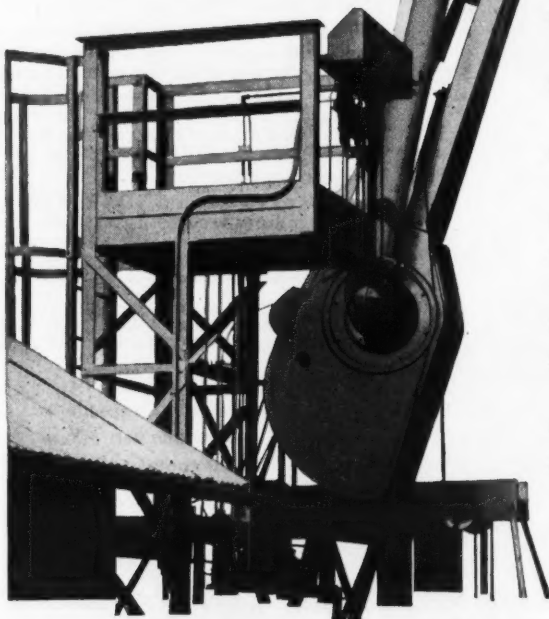


Three retractable screw conveyors deliver sugar to inlet ports on car. Canopy above station permits loading in any weather. Central control station (circle) is also at this point

THE NEW **CHIKSAN**

*Hydraulically
Controlled*

MARINE LOADING ARM



The first basic improvement for loading and unloading of petroleum products in over 30 years.

- Speeds tanker turn-around-time
- Far less manpower to operate
- Long life, trouble free operation
- Elimination of hose bursts
- Lowers fire and work compensation premiums
- Operates from -60°F. to $+225^{\circ}\text{F.}$
- One motor, one switch controls operation
- Static and spark resistant
- No manhandling of hose

CHIKSAN COMPANY; Brea, California

Please send me more information on the Chiksan Marine Loading Arm.

Name

Company

Address

City Zone State

CHIKSAN

A SUBSIDIARY OF FOOD MACHINERY AND CHEMICAL CORPORATION



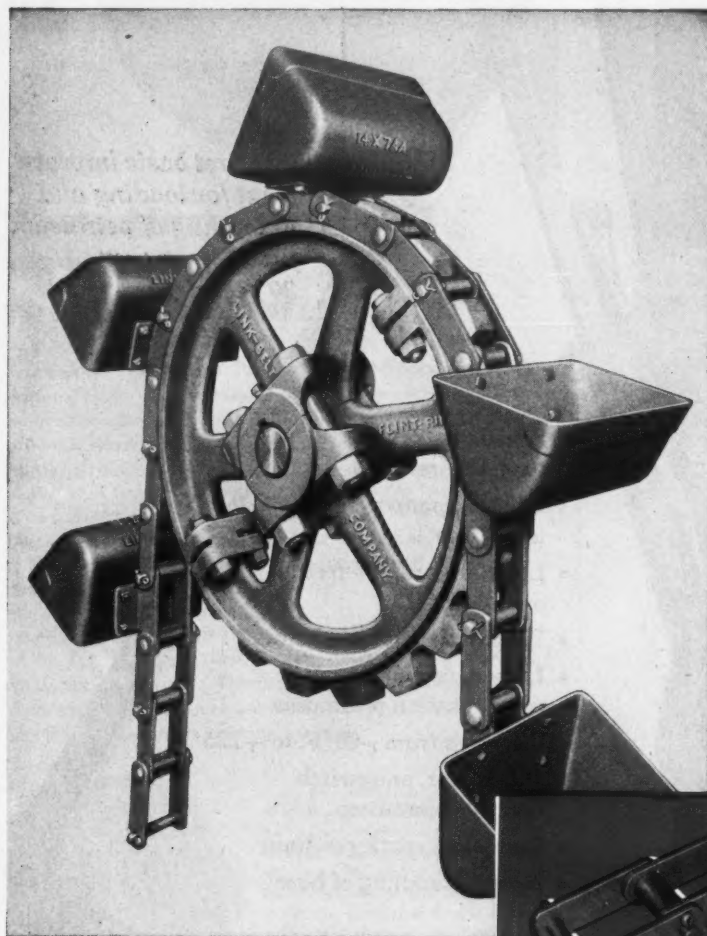
CHIKSAN COMPANY — BREA, CALIFORNIA • CHICAGO 3, ILLINOIS • NEWARK 2, NEW JERSEY

Well Equipment Mfg. Corp. (Division), Houston 1, Texas • Subsidiaries: Chiksan Export Co., Brea, Calif., Newark 2, N. J. • Chiksan of Canada, Ltd., Edmonton, Alta.

When inquiring check CP 4234 opposite last page

4 times the life... $\frac{1}{4}$ the maintenance

through proper selection of LINK-BELT chain



Bucket elevator at fertilizer plant proves advantage of choosing from this complete line

Often there's no need to go to excessively costly cast special alloy chains to get long life. Here's proof: In an Indianapolis fertilizer plant, Link-Belt SS-111 bushed chain (left) handled an average of 75,000 to 80,000 tons of fertilizer before requiring replacement. The previous type of chain had to be replaced after handling 18,000 tons.

This installation is an example of the efficiency and economy that can be gained by applying the one chain best suited to specific conditions from the complete Link-Belt line. Remember, no other single source offers you such a broad range of roller, silent, cast, combination, forged and fabricated chains . . . with matching sprockets.

A call to your nearby Link-Belt office or authorized stock-carrying distributor will bring you all the facts about the complete line of Link-Belt chains and sprockets.

Under severely corrosive conditions, Link-Belt SS chain on bucket elevator of this type in fertilizer plant handled 80,000 tons, to previous chain's 18,000.

Looking for the best
chain for a specific
need? Link-Belt makes
the complete line.



800 Ley
bushed chain



Class C
combination chain



LXS steel
chain



"Flint-Rim"
cast sprockets

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying, Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarborough (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

13.010

When inquiring check CP 4235 opposite last page

MATERIAL HANDLING

Bulk Handling Sugar

(Continued from preceding page)

All conveyors in system are interlocked. Surplus feed to scale by-passes weighing and discharges into one of three storage tanks — later to be drawn off and recycled to scale by bucket elevator.

System of belt and screw conveyors also moves material from scale to truck loading area at opposite end of building from railroad facilities.

Controlling the Flow

Entire feeding and weighing system is controlled from panel board at loading station. Panel houses controls for selecting feed from any of three storage tanks (or from refinery), for controlling screws at loading station, and for delivering single batches of material into the system. Weighing cycle and entire conveying system are also controlled from this point.

Panel contains control lights, indicating when enough material is available for weighing, as well as showing when weighing cycle is completed. Automatic stop counter, stopping scale after a predetermined number of weighings, is also available at control point.

Operation of System

To start loading operation, panel operator sets stop control on desired number of weighings, selects source of feed, sees that system is free of other material grades. Main control switch is moved to "on" position and hopper feed conveyors are directed into inlet ports. At this point, system is put into operation by starting screw feeding three outlets.

Network is interlocked, preventing mixture of sugar as different grades are handled. As added safety precaution, system automatically shuts down in event of any equipment failure of malfunction.

(Scale at Jack Frost warehouse was designed and manufactured by Richardson Scale Company, Dept. CP, Van Houten Ave., Clifton, N. J. . . . or for more information check CP 4236 on form opposite last page.)

How to select a rotary airlock feeder

In one portion of 12-page bulletin information is given on the proper methods of selecting a rotary airlock feeder for a particular application. Six basic factors are given for consideration in selection of one of three basic types available. Bulletin contains numerous photographs, specifications, and descriptive material on these units.

Bul P-55 is issued by Prater Pulverizer Co., Dept. CP, 1515 S. 55th Ct., Cicero 50, Ill. When inquiring specify CP 4237 on form opposite last page.

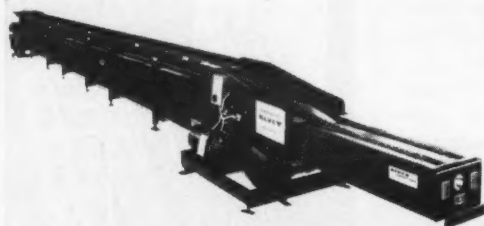
MATERIAL HANDLING

Reaches full length of truck bed for loading, unloading . . .

boom extends into truck to correct position for rapid handling of material

Uses: For loading or unloading material from trucks at loading docks.

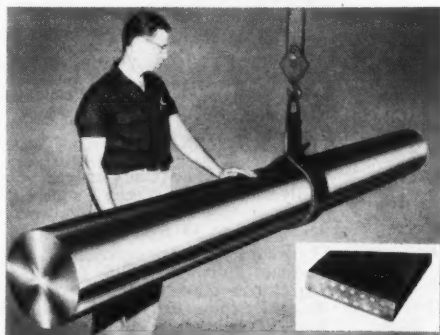
Features: Unit carries material into truck, making it available at exact point of stacking. Conveyor may be extended or retracted as loading or unloading progresses.



Conveyor extends into truck, delivering material to convenient point for stacking

Description: Power conveyor, with push-button control for extension, can be withdrawn into building when not in use, clearing dock aisle.

(Telescopic Boom Conveyor is manufactured by Alvey Conveyor Mfg. Co., Dept. CP, P.O. Box 3031, St. Louis 24, Mo. . . or for more information check CP 4238 on form opposite last page.)



Without marring finished surfaces

. . . this wire-reinforced sling provides safe hitches for lifting. Covered with plastic or neoprene, sling is useful for practically any handling operation, even for rolls machined to a high finish. Covering has little affect on flexibility of sling. Covered slings may be used with either basket or choke hitch.

(Gripper sling is product of The Cambridge Wire Cloth Co., Dept. CP, Cambridge, Md. . . or for more information check CP 4239)

Allis-Chalmers Fork Lift Trucks . . .



One of two Allis-Chalmers Safety diesel fork-lift trucks operated in the kettle room, grinding room and other departments of a mid-west plastics company. These fire-safe diesel trucks were designed specifically for use in hazardous areas where there might be danger of fires or explosions.

stay on the job longer . . .

Reports of Allis-Chalmers Fork Trucks working thousands of hours without lost time are not unusual. Such records are not surprising, either, to those who know the long-life, low maintenance features engineered into these trucks.

Their rugged construction is typified by the

all-welded, automotive-type frame — strongest used. Double-reduction axle and heavy-duty, four-pinion differential lengthen service life. Precision-built mast is a welded high-strength channel. Such features as these add up to *more time on the job.*

get back to work faster

The Allis-Chalmers Fork Lift Truck is a serviceman's dream!

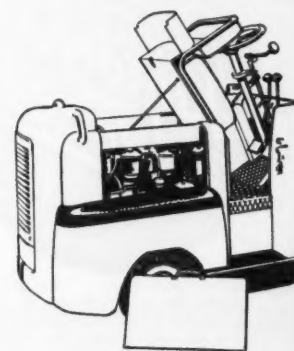
It takes only 22 seconds to strip for service. Lift off two side panels, tip seat forward, remove engine cowl by unscrewing two wing nuts — and everything is right there.

It takes only 22 minutes for two men to disassemble — right down to the bare frame! There are only 20 bolts and nuts to remove.

It takes only 30 minutes to change a clutch. To get at it, you simply remove the floor boards. Clutch plate is replaced without disturbing transmission or axle.

Ask your dealer to show you how Allis-Chalmers Fork Trucks make possible many bonus hours of low-cost operation.

In but 22 seconds, engine, carburetor, oil filler tube, oil filter, fuel pump, battery and ignition system — all are accessible for servicing.



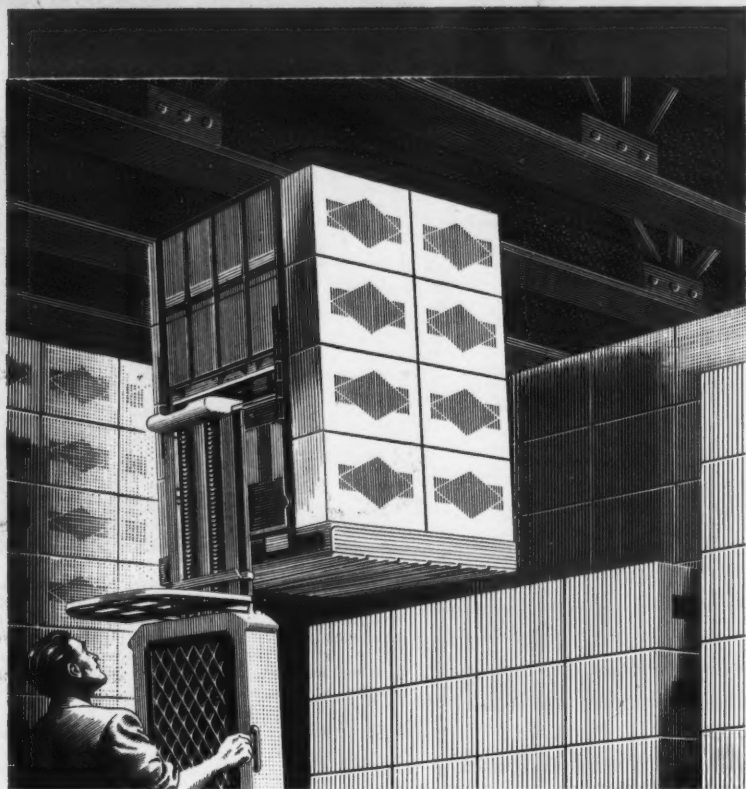
ALLIS-CHALMERS, BUDA DIVISION, MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS



BH-6E

When inquiring check CP 4240 opposite last page



MAKE USE OF YOUR AIR RIGHTS...



CORRUGATED AND SOLID FIBRE BOXES
FOLDING CARTONS • KRAFT PAPER AND SPECIALTIES
KRAFT BAGS AND SACKS

Open space under your warehouse roof may be clear profit... if you can utilize it by stacking boxes taller. But, before you do, be sure your boxes will stand straight and strong under the increased load. Gaylord containers have this valuable "stack-ability" because they are precision built of the finest quality materials.

For information on containers to help you make full use of all your storage space, call your nearby Gaylord office.

GAYLORD CONTAINER CORPORATION • ST. LOUIS

DIVISION OF CROWN ZELLERBACH CORPORATION

When inquiring check CP 4241 opposite last page

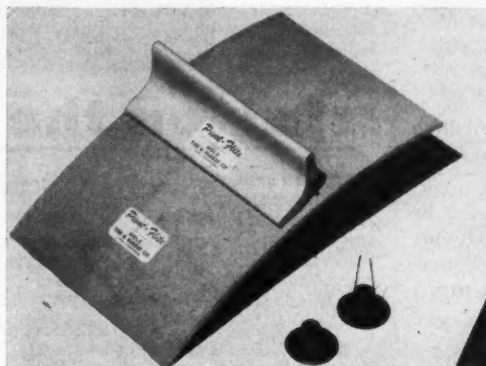
MATERIAL HANDLING

Rubber cleats quickly attached while belt is on conveyor

Molded rubber rivets eliminate damage
caused by metal bolts

Attached to any belt by molded rubber rivets, cleat aids in conveying loads up inclines. Installation does not require removal of belt.

First step: Punch holes in belt, using printed adhesive-backed template furnished with each cleat. Second: Molded rubber rivets are dunked in adhesive and pulled through holes with pliers.



Cleats are easily attached using template, fasteners, and stainless hinge pin

Molded shoulders hold rivets in place and seal moisture out of belt plies. Cleat is then attached to rivets with stainless steel hinge pin.

Pivoted attachment and use of molded rubber rivets eliminate any stiffening at base of cleat. Belt encounters no strain in passing over head and tail pulleys. There are no metal bolts or rivets to work out or to tear belt. In case of severe mechanical hang-up, rubber rivets pull out without damaging belt and are easily replaced. Cleats can be transferred to new belt, if desired. All parts are exposed for washing or steam cleaning. Resilient rubber construction protects fragile loads.

Standard cleats are available in $1\frac{1}{4} \times 1\frac{1}{4}$ " or $2\frac{1}{2} \times 2\frac{1}{2}$ " section dimensions in lengths to fit any belt width.

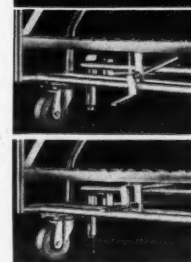
(Pivot-Flite Cleats are made by Holz Tire & Rubber Co., Dept. CP, P. O. Box 618, Lodi, Calif. . . or for more information concerning manufacturer's product, reader may simply check CP 4242 on convenient Reader Service slip which is located opposite last page.)

WORK AT HIGH LEVELS SAFELY...

ON BALLYMORE

"Hi-boy" SAFETY-
STEP
LADDERS

FROM 9 TO 12 STEPS



FOOT-OPERATED BALLYLOCK

Step-on brake casters on front of ladder grip floor . . . prevent ladder from rolling, wobbling or "kicking out." When pedal is released, Ballylock quickly retracts by spring action.

Strong, safe, and easily moved about, Ballymore "Hi-boy" Step Ladders provide sure support at extra-high working levels—up to 15 feet!

All-welded steel construction . . . rust-resistant aluminum finish. Smooth-rolling casters provide complete mobility. Rugged step-on Ballylock extends front legs for firm, stable floor contact.

Four sizes, six models to choose from—each with sturdy handrails. Three types of non-slip tread construction.

Write today for complete specifications to Ballymore Company, Wayne 10, Pa.

**BALLYMORE
LADDERS**



When inquiring check CP 4243
opposite last page

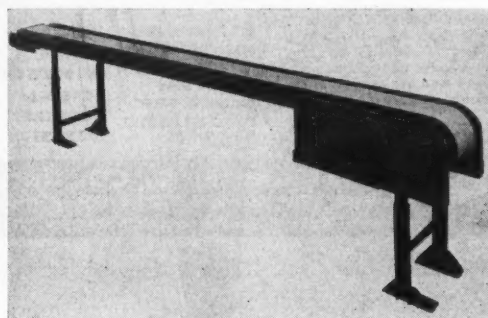
CHEMICAL PROCESSING

**Conveyor, in ten-foot sections,
is available in aluminum,
steel, or stainless . . .**

uses belts, from two to 18" wide, of cotton, canvas, neoprene, or wire mesh

Uses: Horizontal belt conveyor is designed for various production applications, inspection, and packaging operations.

Features: Unit is available in lengths up to 80'. Frames are constructed of aluminum, steel, or stainless steel in 10' sections. Unit can be lengthened or shortened by adding or removing the sections. Three standard frame widths are available: 12, 15, and 21". Frame depth in work area is 21½".



Unit, constructed of 10-foot sections, is available in lengths up to 80 feet

Description: Speed selector provides range of three to one in belt speed. Standard drive is by electric motor and speed reducer. Wider belt speed ranges can be obtained with variable speed motors. Optional equipment includes side rails and additional electric controls as needed.

(Moto-Belt conveyor is product of New London Engineering Co., Dept. CP, 1700 S. Division St., New London, Wisc. . . or for more information check CP 4244 on form opposite last page.)

**Why is torque conversion
important in trucks?**

Printed in two colors, eight-page bulletin discusses general aspects of torque conversion for industrial trucks, describes manufacturer's torque converter and transmission system. Control system of truck is illustrated and described — tips for making best use of torque conversion-equipped trucks are given.

Bul SP-12-Rev. 2 is issued by Towmotor Corp., Dept. CP, 1226 E. 152nd St., Cleveland 10, Ohio. When inquiring specify CP 4245 on form opposite last page.

when **Flexibility** is important
in handling dry materials in bulk

. . . call on

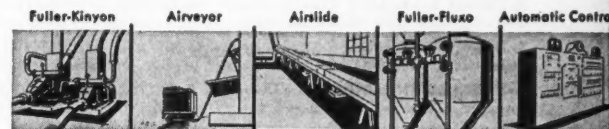
Fuller

. . . . pioneers in harnessing AIR

There's always an easier way of doing things, and one of the best examples you'll find anywhere is the ease with which Fuller conveying systems can be adapted to your plant for moving dry bulk materials in any direction, and any reasonable distance you might require, from Receiving to Storage to Process, thence to Shipping.

Materials flow up, down, horizontally, around corners—through walls, over areaways or streets, underground . . . anywhere a pipe line can be installed. The right combination of Fuller-Kinyon, Airveyor, Airslide, and Fuller-Fluxo systems, with a minimum of moving parts, can introduce into your plant operation a new dimension in materials handling.

Your first step toward better plant layout, efficiency, and materials handling economy is to write for Fuller's informative brochure, "How to Pull Dollars Out of Thin Air," filled with pictures of Fuller Equipment on the job. Do it today.



Fuller
pioneers in harnessing AIR

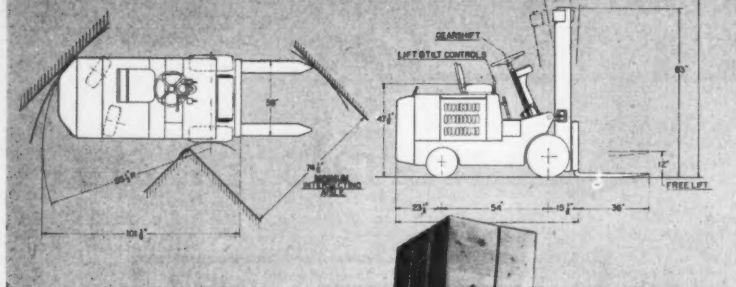
1544
6-117

FULLER COMPANY
136 Bridge St., Catasauqua, Pa.

GENERAL AMERICAN TRANSPORTATION CORPORATION SUBSIDIARY
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When inquiring check CP 4246 opposite last page

BAKER "FG" GAS FORK TRUCK...



Dimensional Drawing of FG-60, 6000 pound capacity.

Why

"BALANCED DESIGN" makes it the best!

"Balanced Design" means that every component be engineered to its specific function. Further that all elements be matched and coordinated to work together for top efficiency, maximum dependable service and longest life.

In the "Balanced Design" Baker FG Gas Trucks, for example, you get an integrated power train, consisting of drive axle, transmission and clutch, selected and engineered to be the best possible unit to perform its required function. Features include: compact rigid construction without troublesome universal joints, split clutch housing for easy accessibility, and single oil supply for entire assembly.

"Balanced Design" also assures you that the power plant is not merely an automotive engine modified for truck use. It is a heavy-duty industrial engine specially engineered for rugged industrial truck service and built by an outstanding manufacturer. Our specifications call for moving parts to balance much closer than ordinary engine parts: pistons balanced to \pm grams instead of ounces, crankshaft to 4 inch-ounces and connecting rods to 2 grams.

These are some of the reasons why Baker "FG" is the only gas fork truck with a full 6 months' warranty, and why we say "BALANCED DESIGN" makes it the best.

Baker "FG" gas fork trucks are available with 3,000, 4,000, 5,000 and 6,000 pound capacities. Specific bulletins can be obtained by writing The Baker-Raulang Co., 1208 West 80th Street, Cleveland 2, Ohio.

8 Reasons Why The Baker FG Fork Truck Is First In Its Class...

- 1. LOWER INITIAL COST**—Costs considerably less than other trucks in its class.
- 2. LONGER WARRANTY PERIOD**—Baker quality permits full 6 months' warranty.
- 3. HIGHER LIFT**—Mast design allows higher standard lift than ordinary trucks.
- 4. LOWER MAINTENANCE COSTS**—Designed for easier and less frequent servicing.
- 5. MORE MANEUVERABLE**—Short turning radius cuts aisle width, adds floor space.
- 6. EASIER TO OPERATE**—Greater visibility... easy-to-work controls.
- 7. GREATER STABILITY**—Lower center of gravity... higher "stability factor" ratio.
- 8. BETTER BRAKING**—Full floating, self-equalizing, self-energizing brakes.

A Subsidiary of Otis Elevator Co.

Baker

handling equipment

MATERIAL HANDLING

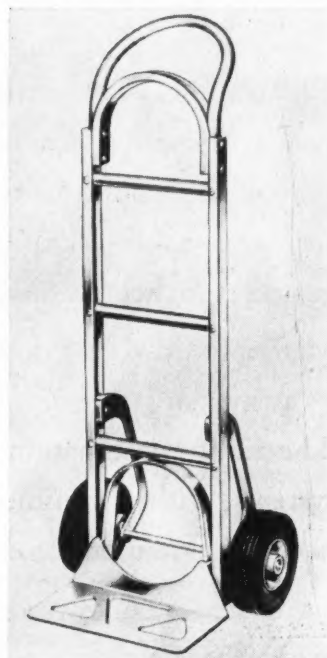
"U-handle" design for hanging, steering...

though 45½" high, truck is light — magnesium frame

Uses: For one-man trucking of material in plants or stockroom.

Features: Unit, of bolted magnesium construction, weighs 1/3 less than steel truck of comparable size.

Description: Truck has 45½" loading height and 7 x 14" nose plate. Curved offset handle permits full-height loading of truck,



Truck has 45½" loading height
... 7 x 14" nose plate

as well as protection for operator's hands. Built-in climbers aid truck's operation on stairs.

Unit is available with either 8 x 2½" puncture-proof tires for use on rough or soft surfaces or with 6 x 2" puncture-proof tires for smooth surfaces.

(Magnesium truck is product of Milwaukee Truck Co., Dept. CP, 250 N. 12th St., Milwaukee 3, Wisc. . . or check CP 4248 on form opposite last page.)



Material Handling Equipment

New OHIOLITE HOISTS

light weight
modern design
high speed
high efficiency
aluminum alloy frame
alloy coil chain
corrosion resistant

OHIOLITE HOISTS... newest, lightest aluminum alloy spur geared hoists. Available in capacities from 1/4 ton.

OHIOLITE CORROSION RESISTANT HOISTS AND TROLLEYS... for use in hazardous atmospheres and places where safety and resistance to corrosion are essential.

Associated with
DICKEY INDUSTRIES



HOIST and MFG. CO., INC.
Teletype CV704 Cleveland 20, Ohio SKYline 2-0900

West Coast Office: 461 Market St., San Francisco, Calif. • EXbrook 2-3233

OHIOLITE HOISTS & TROLLEYS
OHIO CUM-A-LONG PULLERS
ROB CAT ELECTRIC HOISTS
PORTABLE ELECTRIC HOISTS
OHIO CHAIN HOISTS
CONSTRUCTION WINCHES
PLAIN, GEARED AND MOTOR-DRIVEN TROLLEYS
LIFTS
HOIST CHAIN
HAND-OPERATED WINCHES
FLOOR CRANES
OVERHEAD CRANES
LOAD BINDERS

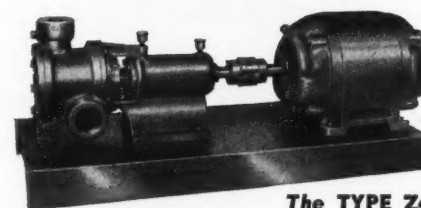


Is the Handling of

LIQUEFIED PETROLEUM GASES, REFRIGERANTS
and other LIGHT NON-VISCOUS LIQUIDS

Bothersome to You?

IT NEED NOT BE



The TYPE Z4
APCO Process PUMPS

WRITE
for
BULLETIN
111-ZA



You are urged to get acquainted with this complete answer to many of the most difficult pumping tasks of modern industry. The characteristics of the most advanced turbine-type pump, the APCO, combine with special new design features, special metals where required to insure SURE RESULTS. May we tell you more?

DISTRIBUTORS IN PRINCIPAL CITIES

AURORA® PUMP DIVISION
THE NEW YORK AIR BRAKE COMPANY
62 LOUCKS STREET • AURORA • ILLINOIS

When inquiring check CP 4250 opposite last page

CHEMICAL PROCESSING

When inquiring check CP 4247 opposite last page

Discharge adjustable from 4 feet to 16 feet off floor . . .

mobile unit handles material on belts 12 to 30 inches wide

Uses: Unit is designed to aid stacking of boxes, cartons, or bags in warehousing or shipping. Also useful in moving material between floors.

Features: Depending on model, low end is adjustable in height from 12 to 36 inches — high end, from 4 to 16 feet.



Mobile boosters, depending on model, can discharge material up to 16 feet off floor

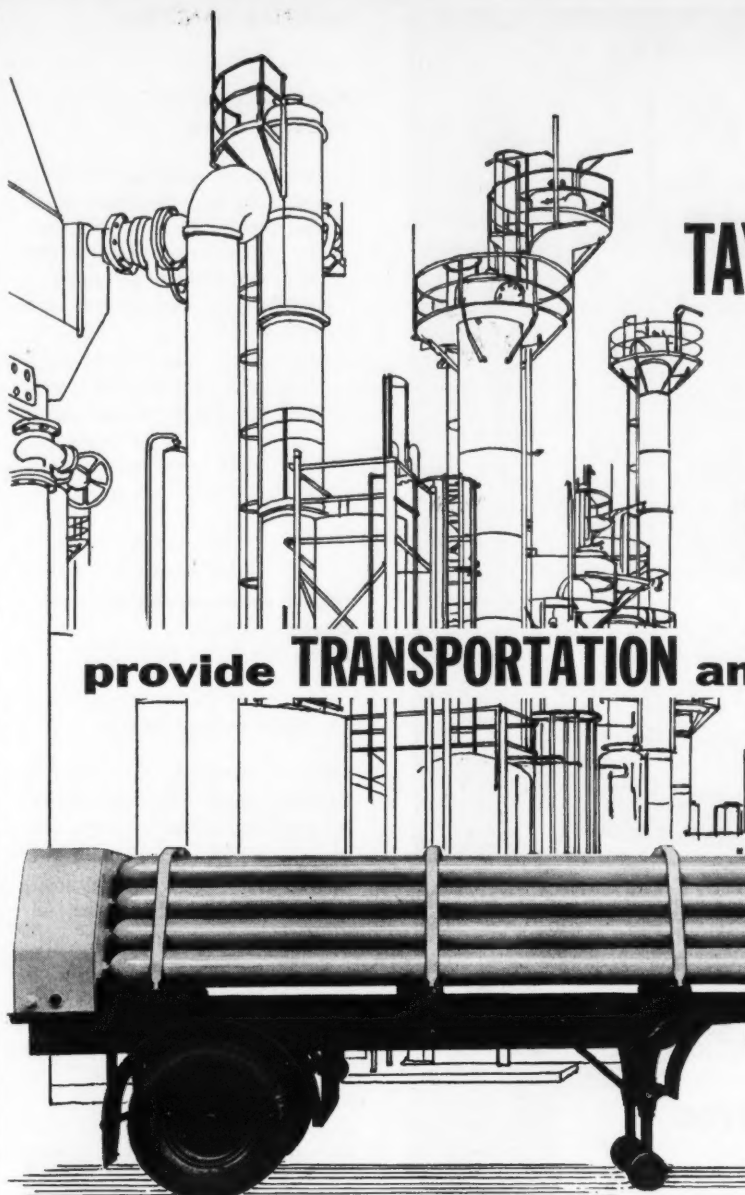
Description: Boosters are available with belts 12, 16, 18, 20, 24, and 30 inches wide. Units are equipped with motors 1/3, 1/2, 3/4, or 1 hp. Unit is reversible, controlled by bar running full length of frame.

(Models PS1 and PS2 Boosters are manufactured by Sage Equipment Co., Inc., Dept. CP, 30 Essex St., Buffalo 13, N.Y. Check CP 4251 opp. last page.)

Details of valves for air handling

Four-page data sheet illustrates and describes line of slide gate valves for pneumatic material handling systems. Scope of data sheet includes applications, design, operations, and installation instructions. Dimensional drawings and tables are included. Several models are illustrated including remote- and manually-operated types.

Data Sheet Ua is available from The Allen-Sherman-Hoff Co., Dept. CP, 259 E. Lancaster Ave., Wynnewood, Pa. When inquiring specify CP 4252 on form opposite last page.



provide TRANSPORTATION and/or STORAGE

TAYLOR-WHARTON GAS TRANSPORTS

Here in a compact trailer is a gas supply equal to several hundred conventional high pressure cylinders. It is so mobile that it can be moved in minutes from one location to another in a large plant area—or between plants. It eliminates the wasted man-power in carrying or dragging ordinary cylinders from job to job.

Taylor-Wharton Gas Transports effect substantial savings for users in many industries. Oil refineries use them for hydrogen and nitrogen in starting the Reforming process. Chemical, electronics and food processing companies which have their own gas generating equipment, use them to cut costs and expedite interplant transportation.

Plants using large quantities of ethylene, hydrogen chloride, boron trifluoride and other relatively new, as well as the commoner gases, find transports the practical answer to their needs. In some cases gas transports are used instead of large permanent storage installations for smaller investment and with greater flexibility.

The tubes meet ICC-3A2400 specifications and are completely heat-treated. The trailers are specially constructed for this service in single and double axle models.

Send for further information, outlining your gas transportation and storage requirements.

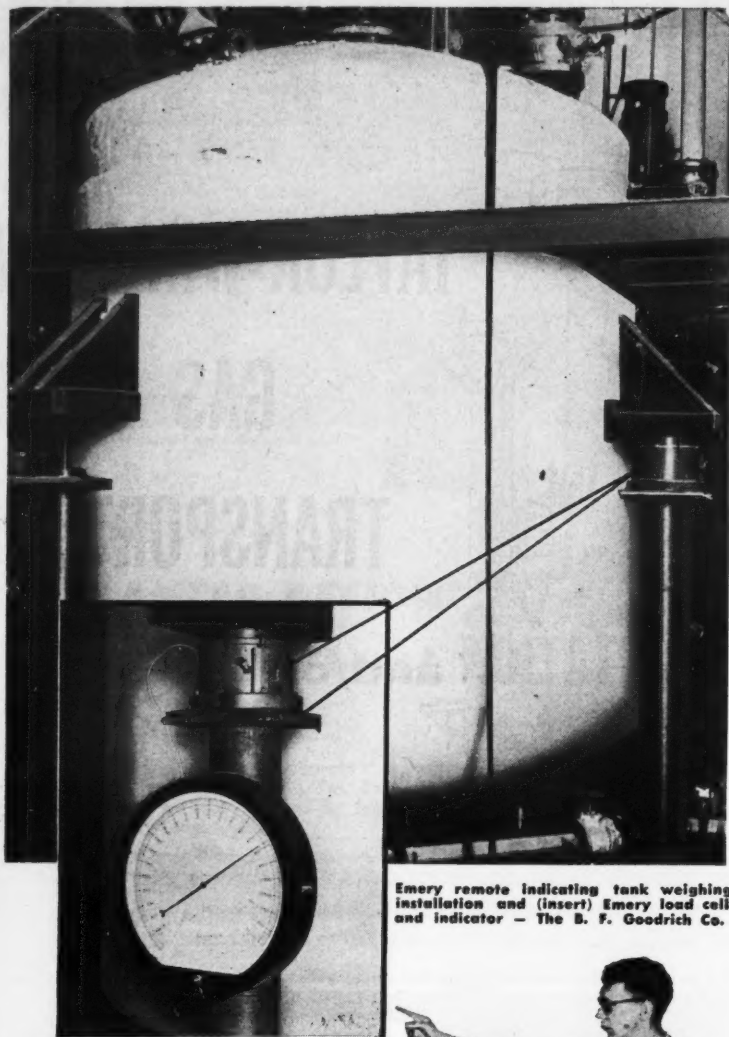
Taylor-Wharton Division

Harrisburg Steel

CORPORATION HARRISBURG 24
PENNSYLVANIA

More than a century in Harrisburg

When inquiring check CP 4253 opposite last page



Emery remote indicating tank weighing installation and (insert) Emery load cell and indicator — The B. F. Goodrich Co.

EMERY WEIGHS COMFORT INTO "TEXFOAM" CUSHIONING

The luxurious comfort of Goodrich "TEXFOAM" rubber-cushioning depends on precise compounding of ingredients. Fast, accurate, utterly-dependable EMERY Tank Scales assure a pin-point weigh-in of ingredients at the processing tanks of B. F. Goodrich Sponge Products Division, Shelton, Conn. Emery tank weighing systems, such as this, save time, money — improve accuracy and quality control in batch or continuous product processing.

Emery manufactures a complete line of precision weighing equipment of all types. Emery also offers practical, experienced engineering assistance in designing weighing systems to meet special requirements. Write us today for full information on "Weight Control" for your manufacturing and processing operations.

THE A. H. EMERY CO., NEW CANAAN 15, CONNECTICUT

When inquiring check CP 4254 opposite last page

MATERIAL HANDLING

**Pictures all types
of hand trucks**

Dozens of pictures in two-color, 12-page bulletin show all sorts of hand trucks, dollies, accessories, and parts. Description with each makes it possible to compare one type with another.

Cat 56G is issued by Nutting Truck & Caster Co., Dept. CP, Faribault, Minn. When inquiring specify CP 4255 on the convenient form which is located opposite last page.

**Highly maneuverable,
trucks can turn
in 73 1/2" ...**

electric fork trucks have
three braking systems

Uses: For plant or warehouse handling of all palletized material or platform skids.

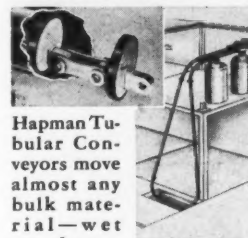
Features: No-cowl permits safer operation as operator can see load and floor immediately ahead.

Description: Line includes trucks with 3000, 4000, and 6000-lb capacities. Turning radius for 3000-lb truck is 73 1/2", minimum intersecting aisle is 66 1/2", clearance for right-angle turn is 87" exclusive of load length.



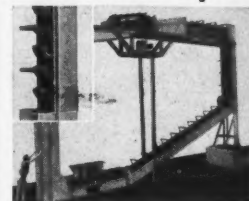
No-cowl construction permits operator to see floor immediately ahead of truck

HERE'S HELP THAT SOLVES TROUBLESOME BULK HANDLING PROBLEMS: *Hapman* Tubular and Pivoted Bucket Conveyors



Hapman Tubular Conveyors move almost any bulk material—wet or dry—through any plane or angle. They're dust, liquid and odor-tight. Investigate!

WRITE for Bulletin T-C36



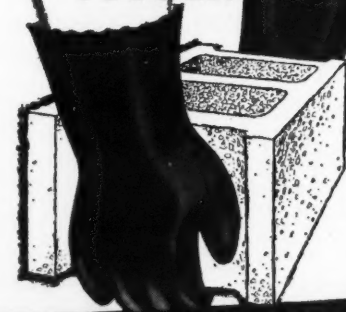
Exclusive top loading device on Pivoted Bucket Carrier handles fragile materials gently. Many other unique advantages.

WRITE for Bulletin P-C36

Hapman CONVEYORS, INC.
DIVISION HAPMAN-DUTTON COMPANY
KALAMAZOO MICHIGAN
In British Commonwealth & Europe: Fisher and Ludlow Ltd., Birmingham

When inquiring check CP 4256 opposite last page

Introducing PACEMAKERS



**New Stanzoil Neoprene
Coated Flannel Industrial Gloves**

15 Design Innovations
Justify This Statement:
"One test on YOUR job
can save you thousands
of glove dollars!"

Knit wrist, 12", 14 1/2" and 18"
Gauntlet styles available in
Light, Industrial and Heavy Duty
weights from leading distributors.
Test samples on request from

the PIONEER Rubber Company

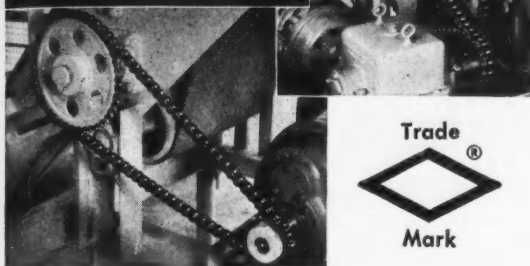
241 Tiffin Road, Willard, Ohio, U. S. A.

Pioneers in Industrial Hand Protection for over 35 Years

When inquiring check CP 4257 opposite last page

CHEMICAL PROCESSING

DIAMOND ROLLER CHAIN DRIVES



◆ From motor to driven shaft, one shaft to another or several, —you will find smooth running, non-slipping Diamond Roller Chain in the pitch size, length, single or multiple strand—that will solve the problem, maintain 98-99 per cent efficiency and 100 per cent speed ratio.

Your production is maintained at the level desired. No unnecessary time out for adjustments or frequent repairs... You can make greater use of Diamond Roller Chain now than you have in the past,—plenty of applications that will further improve your overall output economically. Write for Catalog 754.

DIAMOND CHAIN COMPANY, Inc.

Where High Quality is Traditional

Dept. 411, 402 Kentucky Avenue, Indianapolis 7, Ind.

Offices and Distributors in All Principal Cities

See headings CHAINS or CHAINS-ROLLER in classified section of your telephone directory



When inquiring check CP 4258 opposite last page

for
**CHEMICALLY RESISTANT
JARS, POTS
CROCKS, TANKS**

**Insist On
U. S.
CHEMICAL
PORCELAIN**

Jars, pots, tanks, etc. made from "U.S." Chemical Porcelain are leak-proof, mechanically strong, dense and of virtual zero porosity. They are completely inert to all chemicals except hydrofluoric acid and hot caustics. And porcelain contains no iron to be absorbed—no induced contamination! Its non-aging characteristics make for long, maintenance-free service life. No-seam construction, rounded corners and smooth lustrous white glazed surfaces provide for quick, easy cleaning.

Our complete Chemical Porcelain line of jars, pots and tanks includes a wide variety of stock items in capacities ranging from 2½ to 200 gals.

WRITE TODAY — ask for BULLETIN 410

U.S. STONEWARE Process Equipment
Akron 9, Ohio Div. 241-D

When inquiring check CP 4259 opposite last page

MARCH 1956

MATERIAL HANDLING

Units have three braking systems — hydraulic wheel brakes, parking brake, actuated by spring seat, and dynamic braking, powered by truck's motor. Maximum speed, with load, is approximately 5.2 mph.

(Model FT Trucks are manufactured by the Baker-Raulang Co., Dept. CP, 1250 W. 80th St., Cleveland 2, Ohio... or for more information check CP 4260 on form which is located opposite last page.)

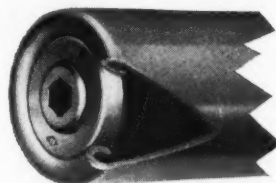
Rounded lip of roller prevents gouging, stops jams...

rounded-lip roller is designed for transfer operations

Uses: Roller is designed for use at conveyor junctions. Rounded ends help eliminate roller-caused damage to products, packages, and cartons, as well as jamming and tie-ups.

Features: Roller houses its bearings in ends which are rolled inward... presenting smoothly rounded end surfaces.

Description: Units turn on 7/16-inch hex shaft, are available



Bearings are mounted inside rolled end... presenting smoothly rounded surfaces

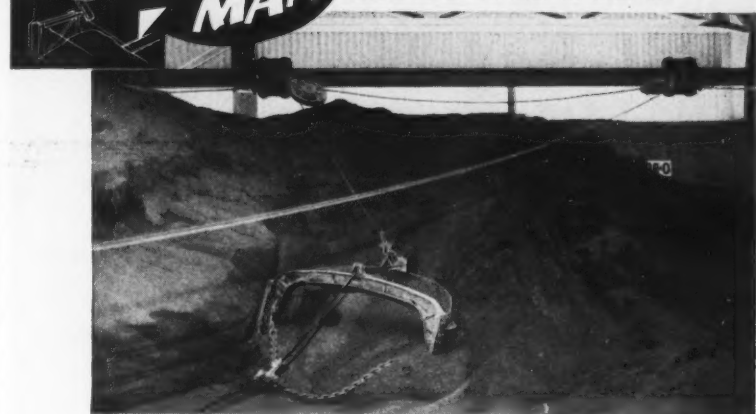
in three types: plain, dust-tight, and grease-sealed construction. Roller is available in two models: 2½-inch diam, 14-gage steel, and 2¼-inch, 16-gage.

(Roller is manufactured by The Alvey-Ferguson Co., Dept. CP, 75 Disney St., Cincinnati 9, Ohio... or for more information about product reader may simply check CP 4261 on form which is located opposite last page.)

Simplify Your Bulk Storage with a

**ONE
MAN**

**SAUERMAN
MACHINE**



(The above installation uses a monorail and tail trolley system to shift the Crescent to another part of the building.)

Scraper Storage Machines consist of these essentials:

- (1) hoist with power unit, either electric, diesel or gasoline.
- (2) Crescent DragScraper Bucket.
- (3) operating cables and guide blocks.
- (4) method of shifting.

A Sauerman Hoist can be placed almost anywhere inside the storage building or outside. Crescent Scrapers handle any bulk material at rates ranging from 20 to 600 cu. yds. per hour.

Various methods of shifting can be used, including the use of a third hoist drum or a separate shifting winch. Both of these methods give automatic control from the operator's station, with no personnel entering the storage area. One man controlling one machine, stores or reclaims at the lowest cost for labor and maintenance.

For ways to reduce your material handling costs, write to Sauerman's experienced engineers. Request Catalog MMM-2, *Chemicals Handling & Storage* and field reports on the handling of chemical bulk materials by Sauerman Machines.

SAUERMAN BROS. INC. 624 S. 28th Ave. • Bellwood, Ill.

When inquiring check CP 4262 opposite last page

New portable Ve-Be-Veyor handles heavy loads—Fast!



The conveyor with the belt that
Can't Run Off Center

THE novel "in-the-groove" feature of the new Farquhar Ve-Be-Veyor revolutionizes power-driven belt conveyors. For now, at last, your conveyor belt will run true and straight from the time you turn on the power in the morning until the last shift is through at night.

Hour-after-hour, this conveyor will carry boxes, cartons, bags—any packaged materials—into, through and out of your plant, factory or warehouse with less worry or attention than you give the family cat. Easily portable because it's made of aluminum.

HEAVY LOADS, TOO . . . Moreover the new Ve-Be-Veyor is no sissy when it comes to doing the work. Actual performance tests, under hard, practical working conditions prove that it stands up to punishment—often carries loads heavier than the entire weight of the conveyor, including the motor unit.

FIND OUT FOR YOURSELF . . . Send for Bulletin No. 600 which tells in detail all about the NEW Ve-Be-Veyors made by Farquhar. Or better yet, ask us for a demonstration, without obligation, of course.

MAIL THIS COUPON

A. B. FARQUHAR DIVISION, The Oliver Corporation
Conveyor Dept. M-64, York, Penna.
Factory branch: 618 W. Elm St., Chicago 10, Ill.

- ☐ Send me Bulletin No. 600 about the Farquhar VE-BE-VEYOR.
☐ Please arrange for a demonstration of the new Farquhar VE-BE-VEYOR.

OLIVER

Farquhar
CONVEYORS

POWER BELT AND GRAVITY CONVEYORS

Name _____
Company _____
Street _____
City _____ State _____

When inquiring check CP 4263 opposite last page

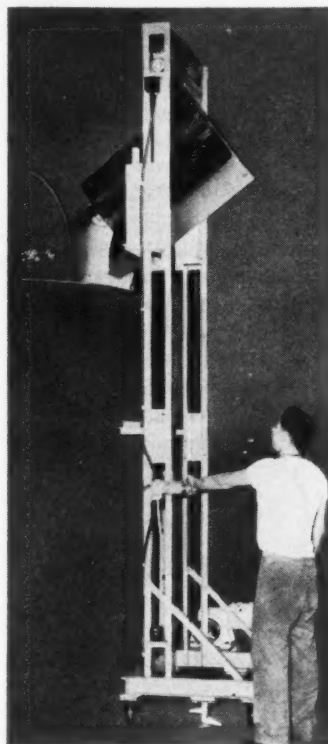
MATERIAL HANDLING

**Portable elevator lifts,
dumps automatically . . .**

will top-load tanks, bins,
vats, hoppers 10' high

Uses: Mobile elevator-dumper automatically lifts, dumps free-falling dry or liquid material from bags, drums, barrels, or boxes. Units are designed for top-loading of tanks, bins, vats, hoppers, and other receptacles.

Features: Elevator, of all-welded steel frame, includes spring-applied electric brake to prevent load from falling when power is cut off. Unit may be converted for lifting purposes by means of quickly-made adjustment.

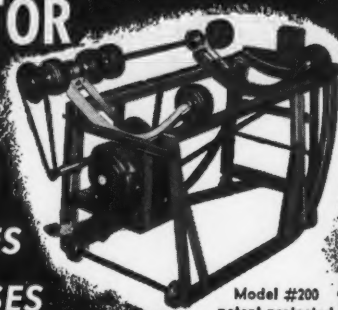


Skip elevator will handle bags, barrels, drums, or 8 cu ft batch box

Description: Units are built in standard models to handle loads from 250 to 1000 lb and special units for heavier loads are available. Elevator with dump heights 10' or less may be equipped with ball-bearing casters and rigid-posi-

inexpensive MORSE portable ROTATOR

- MIXES
- BLENDS
- TUMBLES
- CLEANSSES



In 30 to 55 gal. drums, 1 to 5 gal. cans at rotating speeds 10 to 40 rpm. The four drive-wheels have Neoprene treads, resistant to paint and oil. The idler wheels have Torrington Needle Bearings for smoother operation. Easily loaded—frame has retractable casters. Various speeds are secured through chain sprocket reduction. Morse Model #200 Rotator weighs 115 lb. Write for Bulletin 348 and free folder showing complete Morse line or Drum and Barrel Handling Equipment.

MORSE MANUFACTURING CO., INC.

757 West Manlius St. East Syracuse, N. Y.

When inquiring check CP 4264 opposite last page

DURABLE!

**Resist heat,
wear and
corrosion**

**"Metalsmiths"
Stainless Steel
and Monel
Utensils**

Designed and constructed to meet the strictest requirements of Chemical lab and plant. Many sizes in items shown, plus stock pots, batch cans, beakers, shovels. Try "Metalsmiths" utensils and compare the value. We ship promptly — anywhere.



WRITE FOR LATEST CATALOG — PRICE LIST



METALSMITHS

Division of Orange Roller Bearing Co., Inc.

556 White Street

Orange, N. J.

When inquiring check CP 4265 opposite last page

CHEMICAL PROCESSING



Weld-Bilt DRUM TRUCKS

MAKE DRUM HANDLING EASIER

Weld-Bilt
PRODUCTS

Weld-Bilt Drum and Barrel Trucks, Drum Tilting Elevators, Barrel and Drum Stands, Portable Elevators, Lift Trucks, Platform Trucks, Special Equipment.

Drums, barrels, all sizes, shapes and weight move easily, with less effort—with WELD-BILT DRUM TRUCKS. Sturdily built, with adjustable rim clamp, semi-steel or rubber-tired roller bearing wheels, they are designed for quick-loading, easy moving. Capacity, 620 to 1500 lbs.

Write for Bulletins and prices.

SEE OUR EXHIBIT AT MATERIALS HANDLING SHOW —
JUNE 5-8 — BOOTHS 210-212-309-311

WEST BEND EQUIPMENT CORPORATION
MATERIALS HANDLING ENGINEERS

322 WATER STREET

WEST BEND, WISCONSIN

When inquiring check CP 4266 opposite last page

FOR MAXIMUM SAFETY

all
over
your
plant
use
Safety
GRIP-STRUT



Pat. Pending

the new basic material, all in one piece (including channels), not welded, riveted or expanded in steel or aluminum, in standard sizes and gauges. Safety GRIP-STRUT presents an open space, in a diamond pattern, in excess of 55% of the area for ready access of light and air and gives a positive NON-SKID footing in all directions. Ideal for work platforms, stair and ladder steps, flooring, balconies, catwalks, machinery guards, fire escapes and for original equipment safety treads.

Important Safety Features

- ★ Fire proof
- ★ Slip proof
- ★ Maximum strength
- ★ Minimum weight
- ★ Easy to stand on
- ★ Cool in summer — warm in winter

Big Economy Features

- ★ For balconies — no extra light needed below — no extra heat.
- ★ No extra supports necessary — channels are integral part of the material
- ★ Low in original cost
- ★ No secondary sprinkler heads needed
- ★ Self-cleaning
- ★ Cut and installed like lumber by your own maintenance force

Distributors in all principal cities. Consult yellow pages in phone book under "GRATING."

GRIP-STRUT division

THE GLOBE COMPANY • Manufacturers since 1914
4006 S. PRINCETON AVE. • CHICAGO 9, ILL.

SEND FOR
NEW CATALOG

When inquiring check CP 4267 opposite last page

MARCH 1956

MATERIAL HANDLING

tion floor locks. Fixed location units can be designed to operate at greater heights. Standard units accommodate three types of containers: bags to 24" in width, barrels and drums 18" to 34" high and to 25" diam, and a batch box with 8 cu ft capacity.

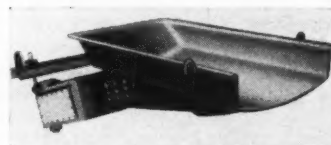
(Skip-dump units are products of Frederick T. Apted Co., Dept. CP, 314 Pamlico Ave., Uniondale, L. I., New York . . . or for more information check CP 4268 on form which is located opposite last page.)

**Dust-tight construction
keeps feeder clean . . .**

long operational life is possible under bad conditions

Uses: Dust-tight unit is designed for applications where spillage from supply hopper might impair action of the electromagnetic drive.

Features: Leaf spring-ends are covered on each side of base casting. Metal plate completely covers armature and core. All plates are bolted to magnet casting against sealing gaskets.



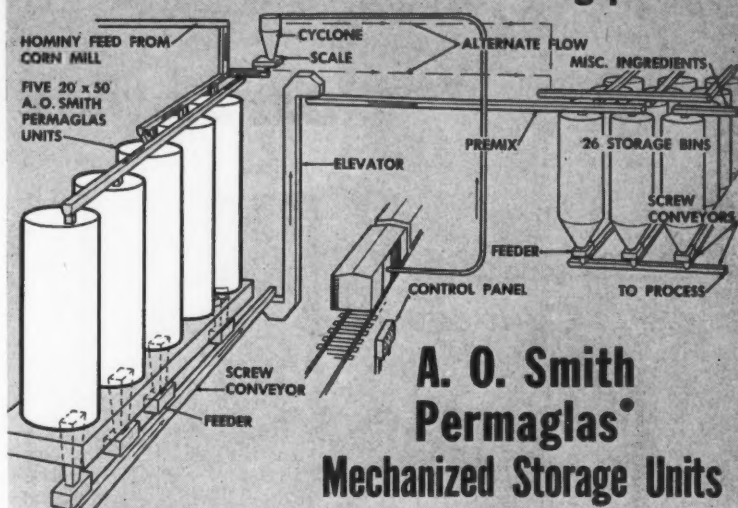
Unit is sealed to prevent dust or material spillage from impairing action of electromagnetic drive

Description: Feeder, with capacity of 500 tph, is equipped with 48 x 60" flat pan trough.

Controller box for wall mounting is provided. Material flow can be regulated over wide range by adjustment on box. Unit operates on 220 v, 60 cycle AC.

(Feeder is manufactured by Syntro Company, Dept. CP, 110 Lexington Ave., Homer City, Pa. . . . or for more information about product reader may check CP 4269 on form which is located opposite last page.)

NEW solution to materials handling problems



**A. O. Smith
Permugas®
Mechanized Storage Units**

**Here's the most efficient way
to handle free-flowing materials
at lower cost.**

Glass-protected steel inside and out — five Permugas Storage Units with mechanical bottom unloading are shown in the flow diagram above. They serve in a modern materials handling system used in the manufacture of Gaines Homogenized Dog Food — a product of General Foods Corp., Kankakee, Illinois.

Incoming raw materials are moved by vacuum from railroad cars to these units. Then A. O.

Smith's exclusive mechanical sweep-arm bottom unloaders take over . . . remove materials — on a first-in, first-out basis — as they are needed for mixing. Handling and storage of individual bags or containers are eliminated. Accurate proportioning of ingredients assures consistent product quality.

Mail coupon for more information about A. O. Smith's Permugas Mechanized Storage Units for more efficient bulk materials storage and handling.

New 6-page bulletin covers complete specifications of Permugas Storage Units with mechanized bottom unloader.



Through research  a better way

A.O. Smith
CORPORATION

HARVESTORE DIVISION
Kankakee, Illinois
Distributor: SPROUT-WALDRON
Muncy, Pennsylvania

A. O. SMITH CORPORATION
Harvestore Division • Kankakee, Illinois

Please send me complete facts about Permugas Mechanized Storage Units.

Name

Address

City State

When inquiring check CP 4270 opposite last page

Robinson

Air Activated

Conveyor

The Low-volume Air Conveyor



► Heart of the Robinson Air-Activated Conveyor System . . . the Activator which so "fluidizes" the charge, enabling it to be handled with low volumes of air.

Averages 1 Cubic Foot of Air per Pound of Materials Handled

Right here is one reason — and a stand-out reason — why the Robinson Air-Activated Conveyor is so economical in handling bulk dry-pulverized and fine-granular materials. Compressed air costs money so, if you can hold air costs down, as with the Robinson, you keep handling costs down. And no other power is necessary to operate a Robinson System.

The reason why the Robinson System can operate with such low air volume is due to the fluidized nature of the charge when transported through the pipes. Pressure alone will not suffice. It requires this Robinson Air-Activation or fluidizing effect. Material "flows" rather than blasts through.

Many Robinson Systems are in service handling a variety of products and in some cases are transporting them several thousand feet. This system may be just what you need for handling those dry, bulk materials in your plant. It has several outstanding features which we'll be glad to discuss at your convenience.

ROBINSON

Air-Activated

A Division of
Morse Boulger Destructor Co.

CONVEYOR SYSTEMS

80-T FIFTH AVENUE • NEW YORK 11, N. Y.

Representatives in Principal Cities

When inquiring check CP 4271 opposite last page

MATERIAL HANDLING

**Tank truck and pumps
handle granular
solids . . .**

pressurizing / pump connects
to customer's line

Uses: Trailer is designed for handling and delivering dry granular materials directly to customer's tank.

Features: Use of pressure tank eliminates rotary valves, screw conveyors, and canvas belts in handling of granular material.



Unit discharges load at rate of
22 tons per hour

Description: Tank is of mild steel, and lined with plastic. Piping is of stainless steel. For a closed system, a return line is provided with dust collector mounted in rear of trailer.

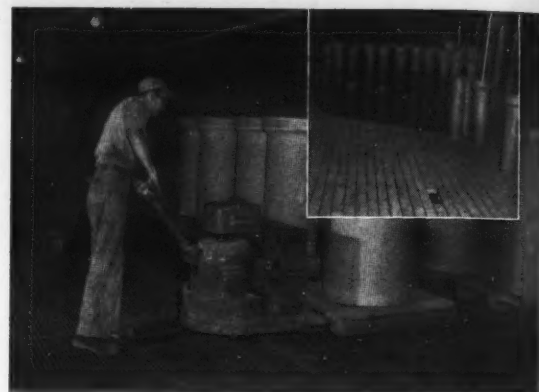
Unit discharges at rate of 22 tons per hour.

(Pressurized trailer is product of Vacu-Veyor Div., Vacu-Blast Co., Inc., Dept. CP, Belmont, Calif. . . . or for more information check CP 4272 on form opposite last page.)

**Shows battery trucks
— part by part**

Printed in two colors, illustrated six-page folder pictures battery-powered industrial trucks — and illustrates each principal part separately. Short descriptions give essential information about these parts. Also included are capacity tables for various models.

Bul 1327D is issued by Baker-Raulang Co., Dept. CP, Cleveland 2, Ohio. When inquiring specify CP 4273 on form opposite last page.



SAFETY IS FIRST WITH TRI-LOK!

Replace your slippery, rickety old wooden floors with the safest flooring available . . . *Tri-Lok* and *Tri-Forged* Grating. Here are some outstanding features: long life, unusual strength, adaptability, handling ease, minimum weight, maximum openings for light and ventilation. *Tri-Lok* and *Tri-Forged* products meet government specifications, are available in a wide range of panel sizes.



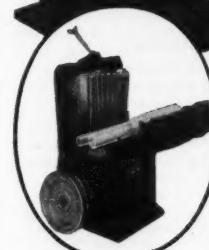
Department D—2403
DRAVO
CORPORATION
Pittsburgh 22, Penna.
National Distributors

When inquiring check CP 4274 opposite last page

PUMP

Liquids • Gases • Slurries

**WITHOUT CORROSION
OR CONTAMINATION**



Wavelike Motion of
Steel Fingers Forces
Material Through Tubing

Prices range from\$55 to
depending on size of pump and
accessory equipment required. **\$500**

Write for Catalog

SIGMAMOTOR Inc.

18 North Main Street • Middleport, N. Y.

When inquiring check CP 4275 opposite last page

CHEMICAL PROCESSING

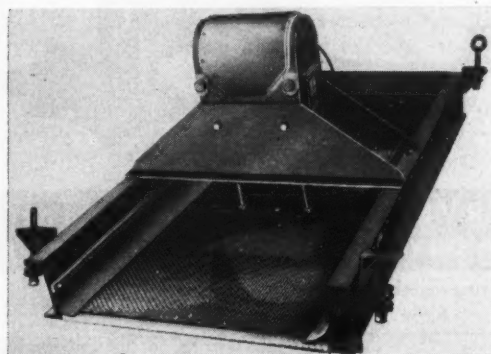
**Electromagnetic vibrator
replaces motor
in screen . . .**

replaceable screencloth available from 20 mesh to 1/4-inch openings

Uses: Effective for high capacity scalping and sizing operations.

Features: Unit uses replaceable screen of phosphor bronze, stainless steel or high tensile steel woven wire cloth. Screen openings of 20 mesh to 1/4" are available.

Description: Screening unit is made on rigid steel frame. Power is by dust sealed electro-magnetic drive, operating from 220v, 60 cycle AC or



Screens of phosphor bronze, stainless or high tensile steel are available

440v, 60 cycle AC. Four screen dimensions are available: 18 x 36, 24 x 48, 36 x 60 and 48 x 72". Screens are of top and bottom hook-strip type.

Unit is supplied with separate electric controller, which can be arranged for wall mounting. Incorporated in the controller is a tap switch which may be adjusted to control amplitude of vibration of the screen.

("VSF" pulsating magnet vibrating screens are produced by Syntro Co., Dept. CP, Homer City, Pa. . . . or for more information about product check CP 4276 on form which is located opposite last page.)

**Miscellaneous storage supplies
collected in catalog**

Printed in several colors, pocket-size catalog of 32 pages shows all sorts of storage and bin units for small parts.

Storage Catalog is issued by General Industrial Co., Dept. CP, 5746 N. Elston Ave., Chicago 30, Ill. When inquiring specify CP 4277 on form opposite last page.



Making control look easy in automatic proportioning

These Richardson Scale Company technicians have an important job . . . checking out a remote control panel for a Richardson Select-O-Weigh Proportioning System. Large units or small, like this one—all get the same thorough pre-shipment test. Here accurate proportioning is made to look easy—just a matter of setting a dial. But there's *more* to automatic control than a control panel . . . much more!

Richardson engineers know that accurate control of material flow and exact proportioning *depend as much on precise design of storage bin, feeder, and scale* as they do on electronic perfection. The storage bin must be properly sloped to prevent bridging or flushing; the feeder must provide

positive, consistent material movement; the scale must weigh accurately to within superfine tolerances. And all must be integrated to insure a dependable, correlated performance—without human supervision all along the way!

The value to you of a Richardson Select-O-Weigh system lies in the quality of your finished product . . . both now and for year after profitable year. Protection of that quality is worth greater consideration than initial cost (and Richardson costs less on a value per dollar basis). It is worth your thorough analysis of the proportioning system itself! Richardson invites you to analyze—and specify—Select-O-Weigh. Send for Bulletin 0351 for more information.

When it comes to proportioning, you're in good company when you come to Richardson. Look at some of the others who now have proportioning by Richardson:

The Firestone Tire & Rubber Company • General Foods Corp.
General Electric Company • U. S. Bureau of Mines
Reynolds Metals Company • American Rice Milling Co., Inc.
Union Carbide & Carbon Corporation • Ford Motor Co.
Fleischmann Distilling Corp. • The Flintkote Company
Johnson & Johnson • National Distillers Products Corp.
Owens-Illinois Glass Co. • Pittsburgh Coke & Chemical Co.
Celanese Corp. of America • Goodyear Tire & Rubber Co.
E. I. Du Pont de Nemours & Co., Inc. • and many more.

Richardson

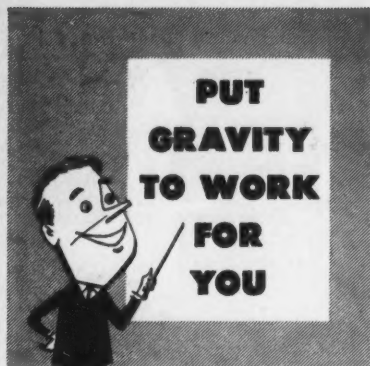
MATERIALS HANDLING BY WEIGHT SINCE 1902

RICHARDSON SCALE COMPANY
Clifton, New Jersey

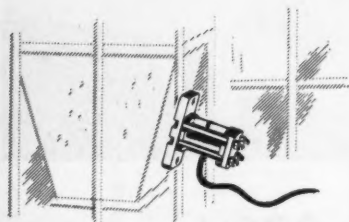
Atlanta • Boston • Buffalo • Chicago • Cincinnati • Detroit
Houston • Memphis • Minneapolis • New York • Omaha
Philadelphia • Pittsburgh • San Francisco • Wichita • Montreal
Toronto • Havana • Mexico City • San Juan

Richardson Scales S.A. 1-3 Rue de Chantepaulet,
Geneva, Switzerland

When inquiring check CP 4278 opposite last page



Gravity is the cheapest prime mover available. It will empty bins, convey materials, aid in transportation . . . but it can't solve the problem of handling dry or viscous materials.



It takes the engineered application of Cleveland Vibrators to break up the frictional forces which cause adhesion and jamming. Vibration keeps materials moving in a full and controlled flow.

Cleveland Vibrators can be installed on all types of equipment for handling and processing chemicals. We will be happy to give you detailed data for your specific application, or a catalog for your reference files.

Air or Electric
Portable or Permanent
Silent or Standard



2706 Clinton Avenue • Cleveland 13, Ohio

When inquiring check CP 4279 opposite last page

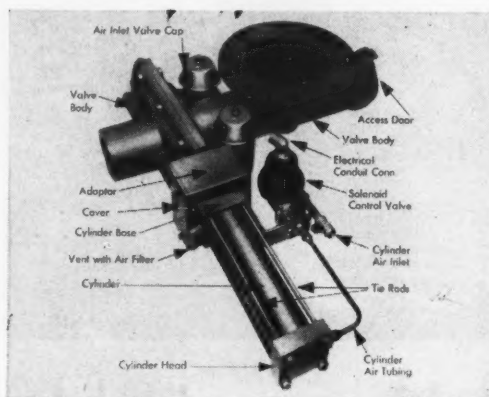
MATERIAL HANDLING

Provides efficient flow control in pneumatic transport of fly ash . . .

valves are available with either air-electric, remote or manual controls

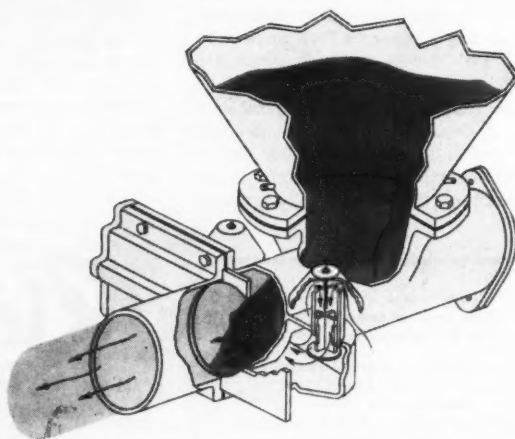
Uses: For installation in vacuum transport piping systems in handling such materials as boiler fly ash and other industrial dusts.

Features: Self-feeding feature of valve eliminates plugging. Atmospheric air, admitted into vacuum system through inlet ports, continuously



picks up and sweeps material through valve into transport piping at rates automatically matched to the increases and decreases of load in system.

Because rate of feed is continuous and commensurate with air flow, there is never any sudden application of full vacuum to plug system.



Description: For air-electric operation, valves are equipped with air cylinders controlled by three-way solenoid valves. For remote operation, valves are equipped with air cylinders controlled by three-way valve mounted on a central control

USE THE

LIFT-O-MATIC
POWER TRUCK ATTACHMENT

for
HANDLING DRUMS
with a
POWER
FORK TRUCK
WITH FORKS
LEFT ON
OR
REMOVED

Simple, automatic, mechanical handling of any size or type of drum—single or multiple.



WRITE FOR CATALOG **MARVEL INDUSTRIES, Inc.**
2234 CLEVELAND ST., EVANSTON, ILLINOIS

When inquiring check CP 4280 opposite last page

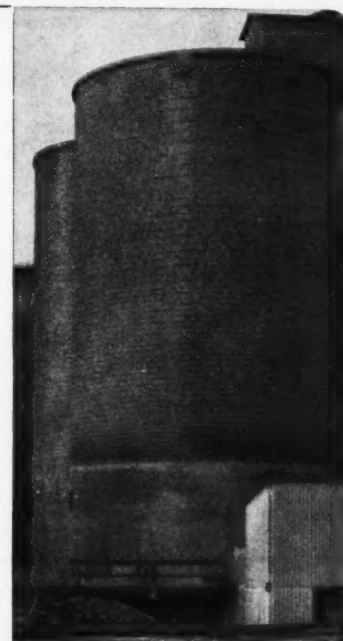
2 of the 6 Neff & Fry Bins at National Gypsum

These two 30' dia. x 66 1/4' high bins are used by National Gypsum Co. at Bellefonte, Pa., for handling and storing raw lime from the kiln.

We've had experience in erecting bins and helping to design conveying systems for nearly 100 kinds of flowable bulk materials. This experience will prove valuable to you if you have such a project in mind.

There are many advantages in our type of bin construction. The outstanding feature is the Super-Concrete Stave with diagonal ends—dense and hard, does not spall or rust or burn.

Our folder, "Bins With the Strength of Pillars," is well worth a few minutes reading time. You are invited to ask for a copy.



NOT EXPORTED EXCEPT TO CANADA AND MEXICO

THE NEFF & FRY CO. • 166 Elm St. • Camden, Ohio

SUPER-CONCRETE STAVE STORAGE BINS

When inquiring check CP 4281 opposite last page

CHEMICAL PROCESSING

panel. For manual operation, they are equipped with either push-pull rods (where valves are hand high) or with chainwheels and hand chain (where located overhead).

Access door in line with centerline of piping system permits quick inspection and entrance into valve. Maintenance can be performed on one valve without interfering with operation of other valves in system.

Air inlet port opening can be adjusted to accommodate different materials, to control draft at each collecting hopper and to prevent air infiltration during collecting periods simply by turning a nut on an adjusting screw.

Valves permit maximum use of carrying capacity of piping system because high material concentrations permit use of smaller diameter transport piping. As a result, valve having four-inch diameter outlet is large enough to accommodate handling rates of four-inch, five-inch, and six-inch transport piping systems.

(Type C valves are available from The Allen-Sherman-Hoff Co., Dept. CP, 259 E. Lancaster Ave., Wynnewood, Pa. Check CP 4282 opposite last page.)

Shows how to anchor load in boxcars

Printed in black and white, 14 x 11" illustrated chart shows check points and loading methods for boxcars.

Chart is issued by Signode Steel Strapping Co., Dept. CP, 2600 N. Western Ave., Chicago 47, Ill. Specify CP 4283 on form opposite last page.



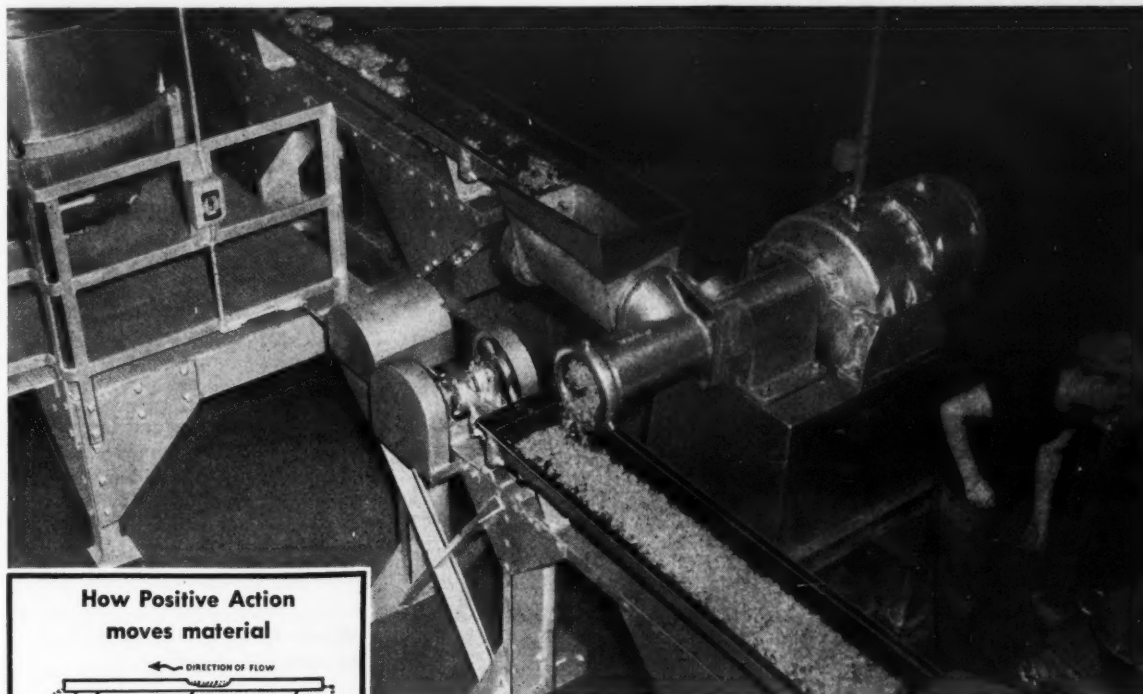
"Seen George?"

ARRANGE YOUR OWN

oscillating conveyor system from stock components



LINK-BELT FLEXMOUNT OSCILLATING CONVEYORS are pre-engineered—can be bought from local stocks. Standard sections of 8, 12, 18-in. widths make selection easy . . . assembly simple. Heavy-duty 36-in. wide units are also available from local stocks.



How Positive Action moves material



Positive-action, constant-stroke eccentric drive provides a powerful, yet gentle upward and forward oscillating motion. Large volumes of material are moved in a uniform, continuous flow, regardless of surges. Resonant spring action of resilient legs cuts power requirements to a minimum. Only maintenance is drive lubrication.

LINK-BELT

FLEXMOUNT OSCILLATING CONVEYORS

Typical of flexible arrangements possible with FLEXMOUNT is this conveyor combination carrying meat to and from a grinder. Stock sections can be built to any length desired . . . up to 100 ft. with a single motor. Dividers are available for simultaneous handling of two or more materials, and metal covers can be added for dust-tight enclosure.

EASY to order . . . easy to install, economical Link-Belt FLEXMOUNT conveyors are an established answer for a wide range of hard-to-handle materials. Whether pulverized, granular or lumpy . . . hot or cold, wet or dry, corrosive or abrasive—effective handling can be arranged with a minimum of engineering detail.

When your material moves on FLEXMOUNT . . . positive, jam-

proof action plus safe, compact, leak-proof design provide top efficiency and capacity. And if sanitation is among your requirements, you'll welcome the ease of cleaning these conveyors.

See the versatile Flexmount at your nearby Link-Belt Factory Branch Store or Authorized Stock-Carrying Distributor, or write for Book 2478.

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World.

When inquiring check CP 4284 opposite last page

What's Your Bin S.Q.?

* Safety Quotient

How safe are your bins? Do you require an employee to endanger his safety and possibly his life by attempting to prod hung-up material from inside the bin. If so, you are creating a definite safety hazard.

Modern plant methods call for—



for safe, efficient, mechanical material flow!

PneuBin panels . . . mounted on the inside walls of your present bins and operating from your regular plant air supply . . . inflate and deflate in regulated cycles positively displacing the bin contents to free flow.

PneuBin decreases plant operating costs by reducing maintenance, insures constant material flow to production lines, eliminates accidents to personnel and increases other personnel's efficiency through its quiet operation.

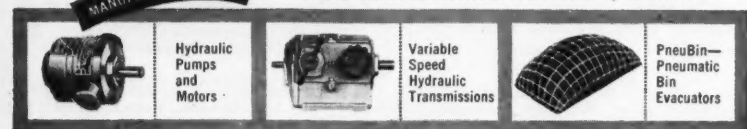
Send for "Flow Stoppage Report" and FREE literature. PneuBin engineers will gladly make recommendations with no obligation on your part.

GEROTOR

MAY CORPORATION

MANUFACTURERS OF—

1527 MARYLAND AVENUE, BALTIMORE 3, MARYLAND



When inquiring check CP 4285 opposite last page

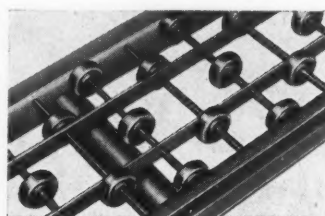
MATERIAL HANDLING

Replace enamel finish with galvanized steel . . .

gravity conveyors are available in 12- to 24-inch widths

Uses: Gravity conveying of boxes, cartons, pallets, or similar material.

Features: Units are designed for outdoor operations or in moist areas such as cold storage rooms and warehouses where cold causes water condensation.



Galvanized conveyors are designed for use in moist areas

Description: Skatewheel conveyor units, of all-galvanized construction, are available in all widths from 12 to 24".

(Galvanized conveyors are manufactured by The Rapids-Standard Co., Inc., Dept. CP, Grand Rapids 2, Mich. Check CP 4286 opposite last page.)

Whole line of trucks pictured in sheet

Catalog sheet describes and illustrates complete line of powered industrial trucks. Capacity ranges from 2000 to 10,000 lb.

Catalog sheet is issued by The Elwell-Parker Electric Co., Dept. CP, 4205 St. Clair Ave., Cleveland 3, Ohio. Specify CP 4287 on form opposite last page.

Your guide . . . to more material handling ideas and equipment is the alphabetical product directory beginning on page 213 in this issue

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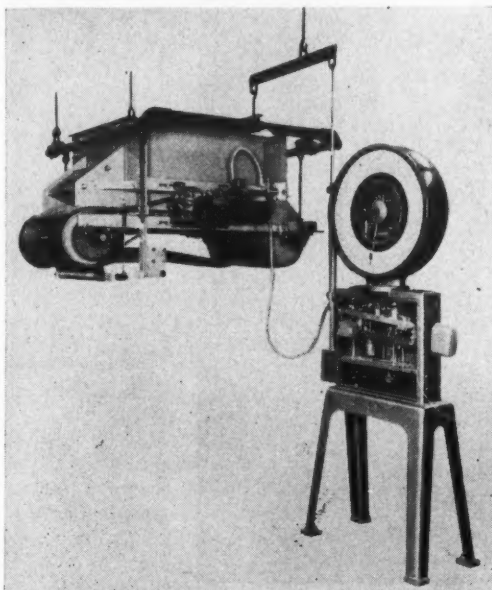
Main Products _____

MATERIAL HANDLING

Sticky, non-free flowing materials weighed as accurately as dry aggregates . . .

unit is comprised of weigher, dial scale and totalizer

Differential scale automatically and continuously delivers a selected amount of material. Allowance is made automatically for tare weight. Unit is made of a weigher, dial scale, and totalizer.



Although it will handle any dry aggregate material, scale is particularly suitable for adhesive materials

Weigher, consisting of a weigh hopper mounted on short belt conveyor, is suspended from levers terminating in dial scale. Belt conveyor provides live bottom for weigh hopper and facilitates discharge of hard-to-handle material.

Suitable for either receiving, shipping, or delivering material to process, scale handles all types of non-free flowing materials, including chemicals, food, fertilizers, cement, and live products.

Scale's control panel contains a totalizer, operating pushbuttons, and multi-colored pilot lights that indicate progress of weighing cycle. It also contains jog buttons for operating system manually. Manual feed jog button can be used to accumulate residue material on the conveyor belt. Discharge jog button enables operator to empty out system completely.

(Differential scale is a product of Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. . . . or for more information about this product reader may simply check CP 4288 on the convenient Reader Service slip which is located opposite last page.)



TRACTOR SHOVEL FLEXIBILITY SOLVES MANY MATERIALS HANDLING PROBLEMS

One big advantage of a tractor shovel over other methods of handling bulk materials is *flexibility*. This contributes to increased efficiency and greater production. The Allis-Chalmers 1½-yard HD-6G, with outstanding versatility and all-round performance, will help your material handling operations in many ways.

First, its adaptability allows it to fit your present setup. It is seldom necessary to change plant layout or make costly installations. At the same time, you avoid the cost of a plant shutdown while installations are being made.

Second, the HD-6G travels wide areas and works in most any footing. This means your storage areas

are not confined within the limits of a fixed structure. The HD-6G stockpiles material, later moves it to any other location at will.

In addition to its primary job, the HD-6G is an extremely valuable machine for general maintenance and countless other odd jobs. Among these are yard road maintenance, spotting cars, excavating for new construction, handling many types of waste, cleaning snow from

roads and parking areas, and building fire walls.

Your Allis-Chalmers dealer will show you, at your convenience, the many new design features that make the HD-6G the best tractor shovel value, pound for pound, anywhere.

Write for FREE catalog.

ALLIS-CHALMERS
CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS



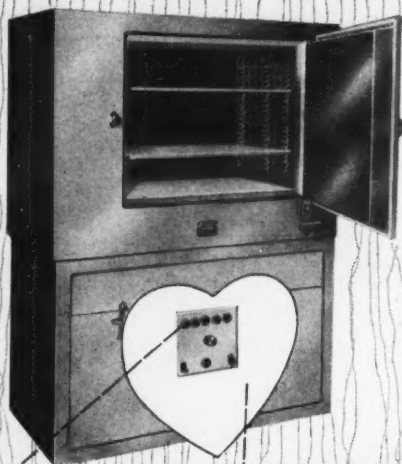
When inquiring check CP 4289 opposite last page

**OUTPERFORMS
ALL OTHER OVENS**
Guaranteed!

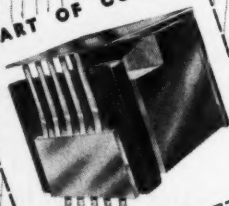
BLUE M CON-WATE MECHANICAL
CONVECTION OVENS WITH

POWER-O-MATIC

U. S. and Foreign Patents Pending



HEART OF CONTROL



***ACTUAL CONTROL
± 1/2° C. OR LESS**

*Not to be confused with
response sensitivity.

BLUE M's Electric Ovens
now use Maximum wattage
ONLY on initial run-up.
When set temperature is
reached, POWER-O-MATIC
goes into action and
MINIMUM wattage is
AUTOMATICALLY
modulated in relation to
temperature and work
load.

**STRAIGHT LINE TEMPERATURE CONTROL
AUTOMATIC HEAT RECOVERY
EXTRA "400%" SAFETY FACTOR**

TEMPERATURE RANGE: TO 316° C.

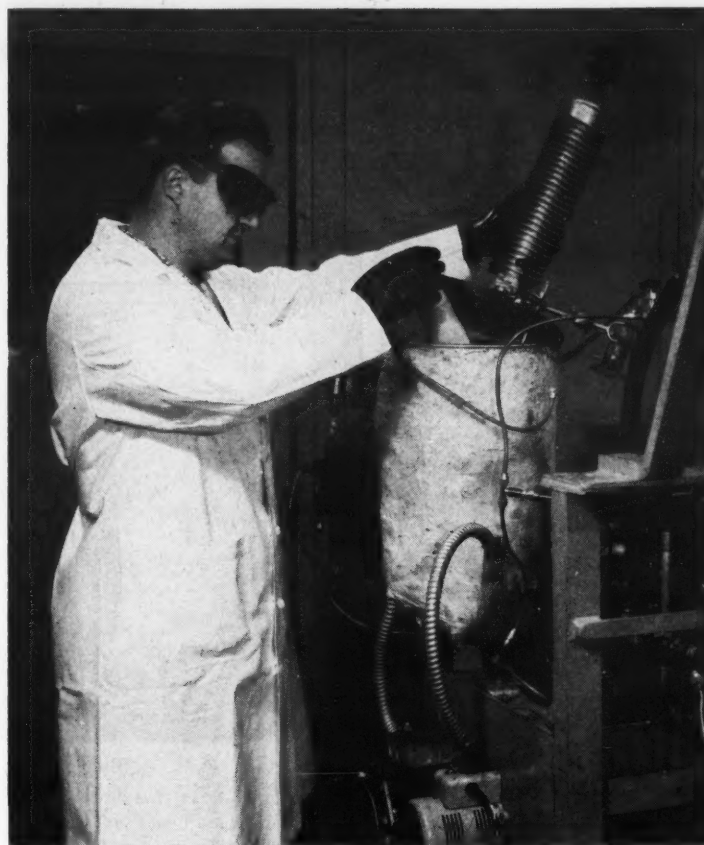
Model No.	W.	I.D. (Inches) D.	H.	Max. Watts	Voltage 50/60 Cycles A.C.	Complete Price
POM-100	14	14	14	2800	115 Volts	\$546.00
POM-110	20	18	20	4000	230V/1 ph.	649.00
POM-120	26	20	20	4400	230V/1 ph.	759.00
POM-130	38	20	25	5800	230V/1 ph.	975.00

ALSO AVAILABLE IN BENCH AND LARGE INDUSTRIAL MODELS
WRITE FOR "THE POWER-O-MATIC STORY"

BLUE M ELECTRIC CO.
138th AND CHATHAM STREET
BLUE ISLAND, ILLINOIS

When inquiring check CP 4290 opposite last page

for the laboratory



Charging sodium bricks to pilot plant-sized unit

Sodium's high reactivity rate can be easily controlled if sodium dispersions are used. Rate of addition controls rate of reaction. Key step—preparation of dispersion—is simplified by package units which have ...

**No loss in
dispersion efficiency
when scaling up
from laboratory to
pilot plant**

Uses: Making sodium dispersions in inert organic media to reduce control problems of sodium reactions both on a laboratory and pilot plant scale.

Features: Heart of two package dispersion units is a flat, saw-toothed "Dissolver" that produces a 2-20 micron sodium dispersion. No loss in dispersing efficiency has been observed in scaling up from laboratory to pilot plant scale. Results can be predicted accurately.

Description: "Dissolver" has no slots or holes to become plugged with solids, making impeller especially suitable for continuous operation and facilitating cleaning. Impeller's effectiveness is



Dispersion head inside laboratory-model resin kettle.
Thermometer is at right

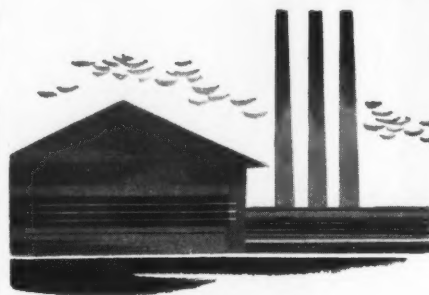
due to hydraulic shear (rapid motion of suspension through itself.) A great change in velocity occurs within a very thin restricted space—above, below, and adjacent to impeller vanes. Intense dissipation of energy with corresponding turbulence gives dispersing action.

Technique of using dispersions was developed as key to control of highly exothermic sodium reactions. Violent surging reactions can be avoided by controlling rate of addition of sodium dispersion to reaction vessel. Steady, uniform removal of heat from reaction system is possible and easy temperature control is allowed. Fine sodium particles also overcome another disadvantage of using block sodium. Insoluble reaction products do not stop the reaction.

Being package units, both dispersion models (laboratory and pilot plant-sized) are complete and ready to set up. Laboratory unit consists of a two-liter resin flask, metal thermometer, copper coil condenser, dropping funnel, and a 3 inch "Dissolver". Heat is furnished by mantle. High speed (18,000 rpm) $\frac{1}{4}$ hp motor drives impeller at 4-5000 rpm through $\frac{1}{2}$ -inch shaft. Baffling is not required in flask. Pilot plant model is similar except that vessel is five gallon capacity; motor is one hp; and "Dissolver" is 6 inches in diameter.

Using the laboratory unit, dispersion produced runs from 2 to 20μ particle size, with most particles being in 8 to 10μ size. With the pilot plant model, dispersion runs 2 to 15μ with average par-

(Please turn to next page)



Harshaw Chemicals

for industrial use

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Electroplating Salts, Anodes and Processes

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Chemical Commodities

for laboratory use

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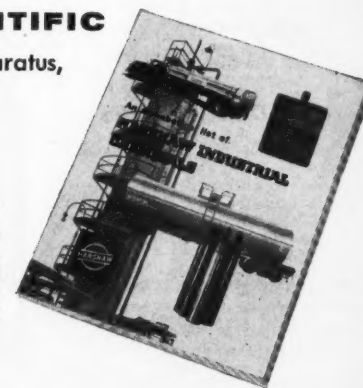
HARSHAW SCIENTIFIC

Laboratory Instruments, Apparatus,

Furniture and Chemicals

WRITE FOR YOUR FREE COPY

This 24-page booklet alphabetically lists the many chemicals available from Harshaw. Pictures of plants, warehouses, research and manufacturing operations are scattered throughout the book. We will gladly send you a copy.



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Pittsburgh 22, Penna. • Hastings-On-Hudson 6, N. Y.

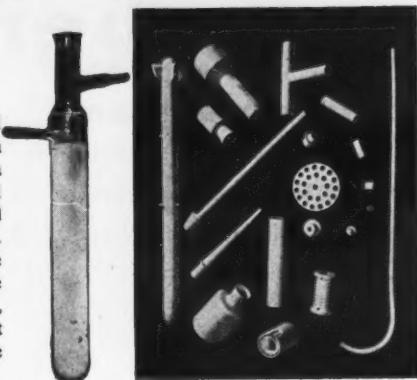
When inquiring check CP 4291 opposite last page

MCDANEL

SHAPES THE CERAMIC . . .

to Suit Your PARTICULAR REQUIREMENTS

• Our business is to create special ceramic bodies or shapes for research or production use. You may need a material to resist abrasion or chemical action, or stand extreme heat or cold . . . or other special requirements. Ceramics may be the answer! We study your drawings and needs. We develop special dies, molds, designs, bodies, mixes and even processes just for your application. Our people are trained for it. Contact us today!



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REFRACTORY PORCELAIN COMPANY
BEAVER FALLS • PENNSYLVANIA

Send us a sketch of
your application.
Your inquiry is
special to us!

When inquiring check CP 4292 opposite last page

if YOUR PROCESS DEMANDS FILTERING, MIXING, STORING

Check

THE ADVANTAGES

Get your copy of our new catalog - see for yourself. There's a difference in Alsop design, construction features, and workmanship that means better, faster, labor-saving operations for you.

CLIP AND MAIL THIS COUPON

ALSOP ENGINEERING CORP.
1103 Alsop Square, Milford, Conn.

GENTLEMEN:

Send me your new catalog of Alsop Filters, Mixers, and Tanks

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COMPANY _____

STREET _____

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ALSOP FILTERS - MIXERS and MIXING TANKS

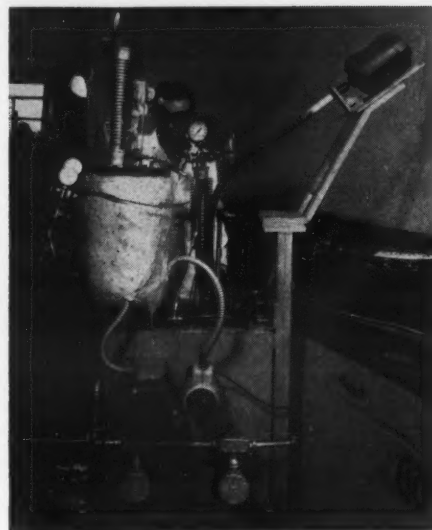
When inquiring check CP 4293 opposite last page



FOR THE LABORATORY

Sodium Dispersion

(Continued from preceding page)



Operating pilot plant-sized dispersion unit

particle size being 6 to 8 μ . Cycle time for lab unit is 6 to 8 minutes and 10 to 20 minutes in pilot plant size.

Laboratory procedure

Laboratory procedure for preparing dispersed sodium is identical with pilot method. After kettle is charged with sodium brick, dispersing medium, and dispersing aid, entire system is heated to 110-120°C by heating mantle. System is kept under dry nitrogen atmosphere. When temperature rises above melting point of sodium, motor is started and impeller speed allowed to reach 4-5000 rpm. As the particle size is reduced, the metallic color of the sodium is replaced with a uniform color of gray.

Dispersion units were developed by Cowles Dissolver Company in cooperation with U.S. Industrial Chemicals Company. U.S.I. has developed policy of loaning pilot plant model, without charge, to companies who have completed laboratory work on sodium reactions and are ready to go into the pilot stage.

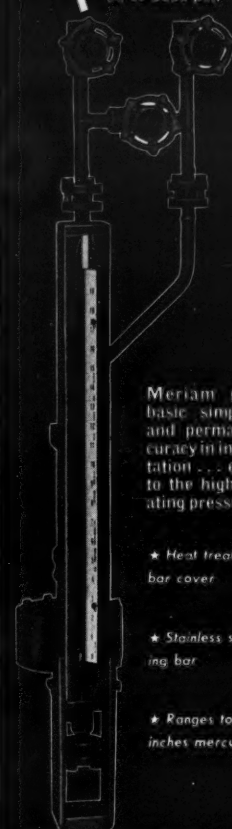
(Sodium dispersion units are product of Cowles Dissolver Company, Dept. CP, Cayuga, N.Y. . . . or for more information about manufacturer's product reader may simply check CP 4294 on the convenient Reader Service slip which is located opposite last page.)

(Detailed information on use of sodium dispersions is available from U.S. Industrial Chemicals Co., Dept. CP, 99 Park Avenue, New York 16, N. Y. . . . or for more information about manufacturer's product, reader may simply check CP 4295 on convenient Reader Service slip which is located opposite last page.)

UNMATCHED ACCURACY

at highest working pressures

At pressures up to 2000 psi, this Meriam Manometer provides critically accurate flow or differential pressure measurement. Constructed of solid bar stock steel, all parts are precision fitted, hand lapped. Each unit is cold hydraulic tested to 5000 psi.



Meriam provides basic simplicity . . . and permanent accuracy in instrumentation . . . extending to the highest operating pressures.

★ Heat treated glass bar cover

★ Stainless steel backing bar

★ Ranges to 70 inches mercury

Write for Bulletin C-12.

Meriam Manometer Instrumentation

*...for pressures, vacuums,
flows, liquid levels.*

meriam

INSTRUMENT COMPANY

10920 Madison Ave. • Cleveland 2, Ohio

When inquiring check CP 4296 opposite last page

CHEMICAL PROCESSING

Why let foam
HOG
your profits?



use DOW CORNING Silicone Defoamers

The most versatile and efficient foam killers ever developed, they increase your productive capacity; reduce processing time; eliminate the waste and fire hazard of boil-overs.

In the **PROCESS INDUSTRIES**, including textiles, paper, rubber and specialty chemicals, foam is killed with Dow Corning Antifoam* A Emulsion, or with Dow Corning Antifoam A Compound as a solvent dispersion or mixed with an ingredient of the foamer.

In **FOOD PROCESSING** foam is controlled with Dow Corning Antifoam AF Emulsion, permissible at concentrations up to 34 ppm or, with Dow Corning Antifoam A at concentrations up to 10 ppm.

EFFECTIVE AT LOW CONCENTRATIONS

For example, you need only:

1 oz. Antifoam A Compound in 62,500 lbs. of 70% caustic liquor.

1 oz. Antifoam AF Emulsion in 2,075 lbs. chocolate syrup.

TEST THEM FREE!

Mail coupon today
for sample

DOW CORNING
SILICONES

Dow Corning Corporation
Midland, Mich., Dept. 3203

Please send me:

- ☐ Booklet on Silicone Defoamers; FREE sample of ☐ Antifoam A Compound ☐ Antifoam A or ☐ AF Emulsion;

NAME _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

*U.S. REG. U.S. PAT. OFF.

When inquiring check CP 4297
opposite last page

FOR THE LABORATORY

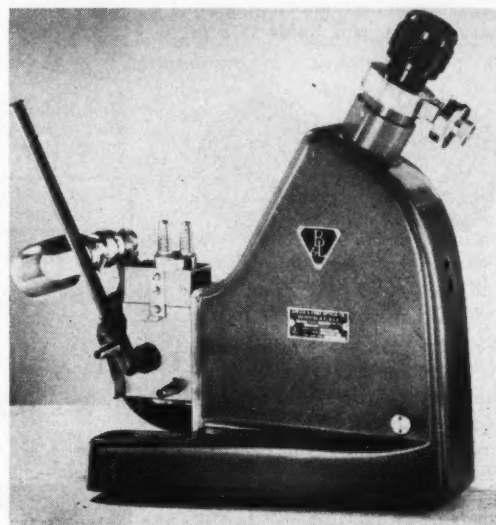
**Increases speed, accuracy
of edible oil tests
for purity . . .**

direct readings of refraction are made in butyrol number, with accuracy of 0.1%

Uses: Determining purity of edible oils.

Features: Spiral-flow copper heat exchanger keeps temperatures constant. Possibility of sample contamination is reduced by clean design.

Description: Direct readings of refraction are made, through micrometer-equipped eyepiece, in butyrol number with accuracy to 0.1%. Horizontal sample mounting position allows unobstructed



Temperatures are kept constant by spiral-flow copper heat exchanger

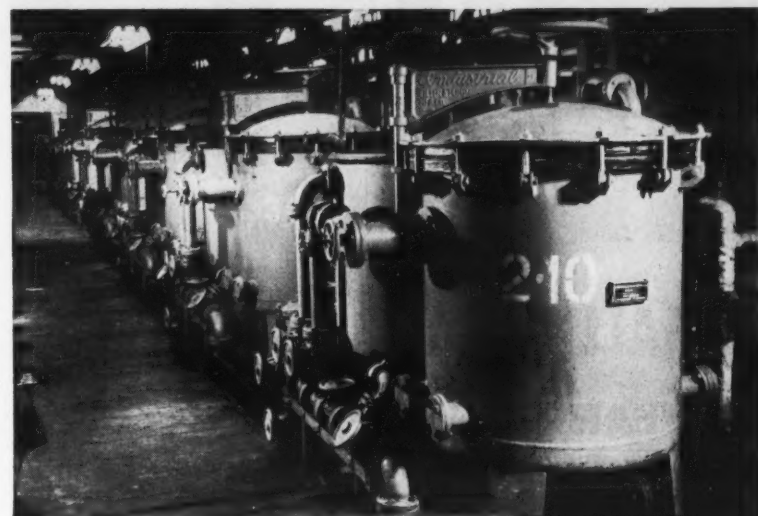
view of oil sample and also easy loading and cleaning. Prisms are mounted with special cement in corrosion-resistant housings. Light source is built on and samples can be read by either transmitted or reflected light.

(Butyro refractometer is product of Bausch & Lomb Optical Co., Dept. CP, 635 St. Paul St., Rochester, N.Y. Check CP 4298 opposite last page.)

Shows lab stirrers and cabinets

Illustrated catalog of 44 pages shows complete line of laboratory equipment manufactured by company. Booklet describes laboratory shakers, stirrers, electro-analyzers, slide cabinets.

Cat 55D is issued by Eberbach Corp., Dept. CP, 200 E. Liberty St., Ann Arbor, Michigan. Check CP 4299 on form opposite last page.



SOLVE COMPLEX FILTER PROBLEMS

...WITH INDUSTRIAL'S NEW
BUILT-TO-ORDER FEATURES

Industrial offers much more than a line of standard filters . . . a complete filtration engineering service from fluid analysis to installation. Industrial is ready and able to help you specify the right equipment for common or unusual needs.

Easily adapted for special uses . . . these Vertical Filters typify Industrial engineering . . . purposely designed to be built for your exact needs.

Several of the many possible modifications are shown at the right . . . for recovery of large volumes of solids the bottom opening filter is ideal; for smaller volumes, the clean out door is more practical and less costly. Another example of specialization is the jacketed shell filter, for use where small temperature variations are important. Other optional features are quick-opening covers, individual leaf outlets and self-cleaning devices that offer sluicing, shaking or air wash cleaning.

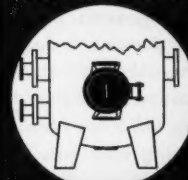
Lower filtration cost . . . proven performance, minimum down time, the use of low cost but efficient filter media plus a design exactly suited to your needs, all contribute to Industrial's low over-all cost per gallon of filtrate.

Write now for details on flow systems, special equipment, filter and leaf construction. Ask for 8 page Bulletin 111.

MODIFICATIONS



RECOVERING LARGE
VOLUMES OF SOLIDS



RECOVERING SMALL
VOLUMES OF SOLIDS



JACKETED SHELL
FOR UNIFORM
TEMPERATURE



INDUSTRIAL

FILTER & PUMP MFG. CO.

5908 OGDEN AVENUE • CHICAGO 50, ILLINOIS

CENTRIFUGAL PUMPS • PRESSURE FILTERS • ION AND HEAT EXCHANGERS • RUBBER LININGS • WASTE TREATING EQUIPMENT

When inquiring check CP 4300 opposite last page

NEW

"SMALL BATCH"

SHEAR-FLOW



INDUSTRIAL MIXER

To meet the demand for a portable yet rugged mixer to be used by research and development technicians, Gabb engineers have produced this "Small Batch" industrial mixer.

Incorporating all the features of its companion models, this little giant can be used for homogenizing, mixing, dispersing and emulsifying.

Its counter-rotating impellers have a clearance of approximately .005" which produces a double shearing action for perfect dispersion of material. This mixer should be standard equipment in every plant requiring small batch mixing. Send the coupon for complete details and prices now!

CUT YOUR MIXING TIME AND COST.
MAIL THE COUPON NOW.

GABB SPECIAL PRODUCTS

Division of E. Horton & Son Co.
WINDSOR LOCKS, CONN.



- ☐ Have representative call for demonstration
☐ Send more information
Name-Position _____
Co & Address _____

When inquiring check CP 4301 opposite last page

LABORATORY

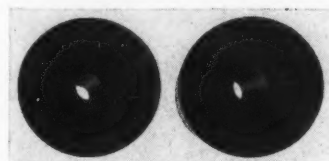
**Stopper design gives
less stopper —
no sulfur . . .**

larger holes in lab stoppers
make for safety and speed

Uses: For increased safety in inserting thermometers, glassware, and tubing in rubber stoppers.

Features: Rubber stoppers have slightly larger holes, yet retain sealing properties.

Description: Insertion of stopper into vessel compresses rubber around thermometer, glassware, tubing, and holds it firm.



Number 4 stopper at right has larger hole for increased safety

The larger holes are available in one-hole stoppers and two-hole stoppers, in sizes 0, 1, 2, 3, 4, 5, 5½, 6½, and 7. Sizes 0 and 1 have 4.5 mm holes; the rest have 5.8-6.0 mm holes.

Manufacturer also has compounded sulfur-free stoppers. With a distinctive blue color, the stoppers are readily identifiable.

(Safety and Sulfur-Free Stoppers are product of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. Check CP 4302 on form opposite last page.)

**Includes price info
on cuvettes**

Two-page brochure includes price information on cuvettes for routine analysis by colorimetric or spectrophotometric methods.

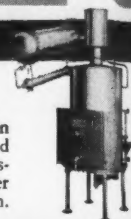
"Standard Grade Cuvettes" is issued by Coleman Instruments, Inc., Dept. CP, 318 Madison St., Maywood, Ill. Check CP 4303 on form opposite last page.

SALE!

DISTILLED WATER

only 1½¢ per gallon

Put a Barnstead Pure Water Still to work in your plant or laboratory. Since 1878 Barnstead equipment has been producing the purest distilled water — and at the lowest cost, too! Over 200 different sizes and models to choose from.



DEMINERALIZED WATER

only 5¢ per 1000 gallons

Barnstead Demineralizers in capacities of 5 to 3000 G.P.H. effectively remove ionizable impurities, making low-cost demineralized water available for countless manufacturing, processing, and laboratory operations.

More than 60,000 Barnstead Stills and Demineralizers now in use in every country . . . in every industry. Write for accurate, impartial answers to your Pure Water Problems.

New York Office
Kingsbridge 8-1557

Barnstead
STILL & STERILIZER CO.

66 Lanesville Terrace, Forest Hills, Boston 31, Mass.

When inquiring check CP 4304 opposite last page

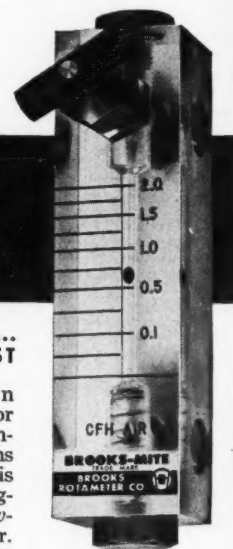
**it's plastic and
it's practical...**

SMALL FLOW INDICATOR

**NEW BROOKS-MITE DESIGN...
RUGGED... AT LOWEST COST**

Here's the well-known BROOKS-MITE Flow Indicator with the new "O" ring construction. Torque limitations of the past are overcome. This is your best meter where rugged service and need for lowest possible cost go together.

The BROOKS-MITE has an acrylic plastic meter body and is available in 24 flow ranges. Optional features include a built-in FLO-MITE needle valve and integrally piped constant differential relay.



Send For
Bulletin No. 120

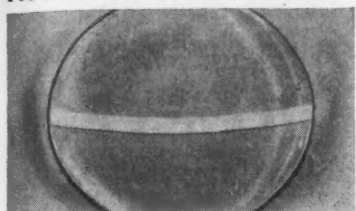
BROOKS ROTAMETER COMPANY

103 EIGHTH STREET • LANSDALE, PA.

When inquiring check CP 4305 opposite last page

CHEMICAL PROCESSING

New Dimensions in Rubber



IMMERSION in red fuming nitric acid for one week has no appreciable effect on the physical properties of KEL-F Elastomer.

KEL-F® fluorocarbon ELASTOMER

has outstanding thermal and chemical resistance

Kellogg's new fluorocarbon rubber is shattering existing concepts about rubber. Here is a chemical rubber that combines superior elastomeric properties with excellent chemical resistance and thermal stability. KEL-F Elastomer was especially developed to stand up under the severest operating conditions involving corrosive atmospheres and high temperatures.

KEL-F Elastomer's other outstanding advantages include: high resistance to fuels, solvents and lubricants... low moisture absorption... non-flammability... excellent resistance to weathering and microorganisms.

This unique combination of properties makes KEL-F Elastomer particularly suited to such heat- and chemical-resistant products as:

HOSE • TUBING • DIAPHRAGMS • GASKETS • SEALS • TANK LININGS • CLOTHING • PAINTS • SEALANTS • ELECTRICAL INSULATION

Kellogg supplies KEL-F Elastomer only in the gum form which in turn is fabricated into specific end products by qualified rubber goods manufacturers. Our technical staff is prepared to show you how KEL-F Elastomer may be the answer to your rubber problem.

SEND FOR NEW BOOKLET on KEL-F Elastomer—its properties and applications. Mail coupon below.

© KEL-F is the registered trademark of The M. W. Kellogg Company for its fluorocarbon products.



THE M. W. KELLOGG COMPANY

Subsidiary of Pullman Incorporated
Chemical Manufacturing Division
P. O. Box 469, Jersey City 3, N. J.

Please send me your newly published booklet KEL-F ELASTOMER.

NAME _____
FIRM _____
POSITION _____
ADDRESS _____

When inquiring check CP 4306 opposite last page

MARCH 1956

FOR THE LABORATORY

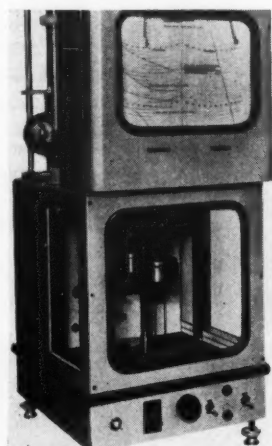
Combines heating and weighing of gravimetric analysis into one operation . . .

instrument furnishes continuous, permanent pen record of all changes

Uses: For gravimetric analysis of large number of samples which require heating to constant weight; determination of moistures, preparation of evaporation rates, carbon and sulfur determinations.

Features: Instrument is self-contained and needs no auxiliary equipment. Photographic development is not required.

Description: Heating chamber is positioned at top and is lowered around the sample charge. Timing device operates



Continuous record of weight changes is made on chart

arresting mechanism at known time intervals, indicating time on recording chart. Materials under test are heated and weighed continuously; results are recorded on chart. Unit has automatic weight-adding and full air-damping. One model has sensitivity of one mg. Another has sensitivity of 0.1 mg. Recording cycle may be changed to meet varying applications. Unit is 15" wide x 18" deep x 48" high.

(Thermo-balance is product of Burrell Corporation, Dept. CP, 2223 Fifth Ave., Pittsburgh 19, Pa. . . . or for more information check CP 4307 on form opposite last page.)

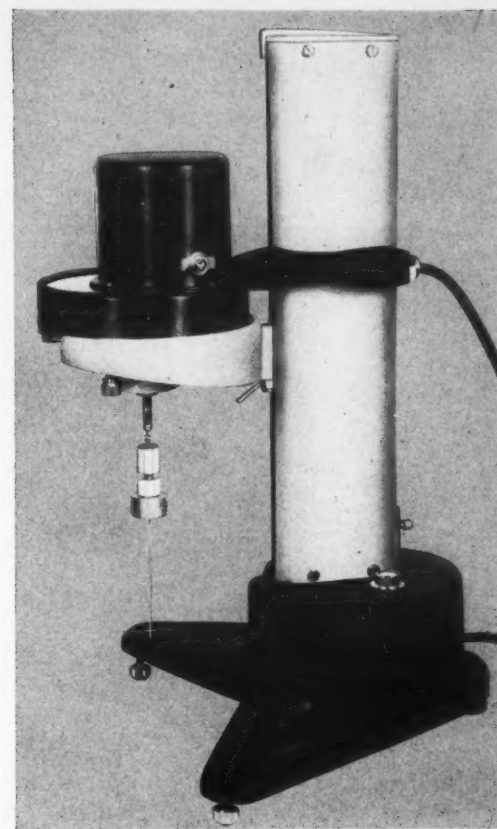
Catalog and price list on PVC labware

Eight-page price list covers manufacturer's line of plastic laboratory ware, tanks, fume hoods, ventilating exhaust fans. Products are made of both high- and low-molecular weight polyethylene and unplasticized polyvinyl chloride. Prices are also given on plastic welding equipment, guns and parts, and welding rod of the three materials.

Price List No. 11 is issued by American Agile Corp., Dept. CP, P. O. Box 168, Bedford, Ohio. When inquiring specify CP 4308 on form opposite last page.

A MUST for your laboratory

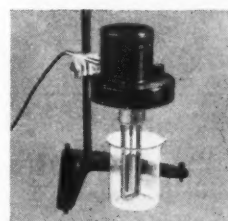
Brookfield Helipath Stand



Non-flowing substances are no longer viscosity-measurement and control problems! The Brookfield Helipath Stand, coupled with your Brookfield Viscometer, actually makes it easy to test, study and control the viscosity of highly-plastic materials, gels and semi-gels.

Regardless of structure, the Brookfield Helipath Stand allows accurate viscosity measurement by automatically lowering a special bar-type spindle through the test material. Throughout its helical path, the spindle constantly measures undisturbed material. Precision engineered, quality manufactured, the Brookfield Helipath Stand is an instrument no laboratory should be without.

FREE! Write, wire or phone for your copy of Brookfield's fully-illustrated brochure.

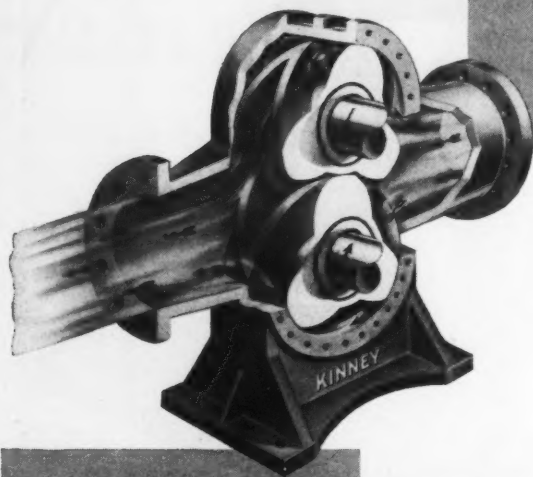


NEW! Now, eight-speed viscometer models with a 200:1 ratio of maximum to minimum speed provide increased accuracy, sensitivity and flexibility. Write for descriptive literature.

Brookfield
ENGINEERING LABORATORIES, INC.
STOUGHTON 54, MASSACHUSETTS

When inquiring check CP 4309 opposite last page

POSITIVE DISPLACEMENT



... WITH LESS REPLACEMENT!

For rugged, reliable, continuous performance . . . for maintenance-free pumping of difficult viscous materials . . . specify KINNEY, the name that means superior pumping to so many American industries. Kinney pumps, besides economically pumping high viscosity materials, can be used for metering and proportioning fixed amounts . . . due to inherent high volumetric efficiency. Request complete technical data . . . or consult a staff member at one of our district offices. District offices are located in Chicago (La Grange), Cleveland, Los Angeles, New York, Philadelphia, San Francisco, and St. Louis. Send for details today!

Send
Coupon
Today

KINNEY MFG. DIVISION THE NEW YORK AIR BRAKE COMPANY

3573 WASHINGTON STREET • BOSTON 30 • MASS.
INTERNATIONAL SALES OFFICE, 90 WEST ST., NEW YORK 6, N.Y.

- Please send Bulletin L51A describing the complete line of Kinney Liquid Pumps.

Name _____
Company _____
Street _____
City _____ State _____

When inquiring check CP 4310 opposite last page

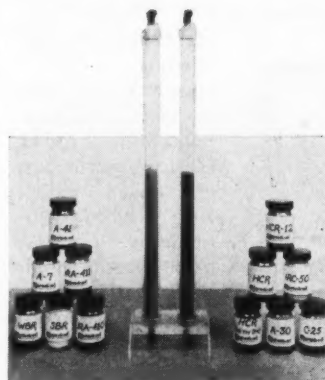
LABORATORY

**Makes kit available
to evaluate twelve
exchange resins**

Uses: Evaluation of ion-exchange resins for specific problems.

Features: Kit is equipped with twelve exchange resins. Includes ion-exchange columns for laboratory evaluation.

Description: Kit includes two Lucite ion-exchange columns and change resins. Five of these resins twelve jars of assorted ion-ex-



Two lucite exchange columns are shown between bottles containing samples of 12 resins

are cation and seven are anion materials. Included with the kit is a manual of more than 100 pages of technical data. This contains instructions for operation. (Model RE-1 research demineralizer is a product of Barnstead Still & Sterilizer Co., Dept. CP, 2 Lanesville Terrace, Forest Hills, Boston 31, Mass. . . . or check CP 4311 on form opposite last page.)

Adapter for viscometer

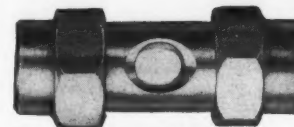
Data sheet of two pages describes adapter for measurement of ultra-low viscosities. Adapter is to be used in conjunction with manufacturer's viscometer.

Data Sheet 034-b is issued by Brookfield Engineering Laboratories, Inc., Dept. CP, 240 Cushing St., Stoughton, Mass. Check CP 4312 on form opp. last pg.

Your vital line fluids are
always in full view when

LIQUID EYE®

Positive Sealing INDICATORS



are on
the job!

Illustrated: 3000 Series I.P.S.

- Extra thick tubular Pyrex sight glass — double pressure sealed at sides and ends with Teflon or Neoprene gaskets (Teflon ideal where high temperatures up to 450° F. are a problem).
- Each unit guaranteed to 600 psi.
- Unrestricted full line flow.
- Precision made in cadmium plated steel or in brass (also available with stainless steel springs for use with corrosive fluids).
- Wide variety of applications.

Write today for Catalog D-55 covering the Allin line.

Standard sizes 3/4", 1" and 1 1/4" I.P.S., with larger sizes available. Special units can be made to your exact specifications.



Allin

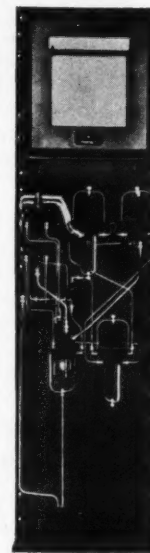
MANUFACTURING COMPANY

1153 W. Grand Ave., Chicago 22, Ill.

When inquiring check CP 4313 opposite last page

CAMBRIDGE GAS ANALYZERS

Labor saving — profit producing!



3-POINT RECORDING
GAS ANALYZERS
(CO₂, H₂, CO)

Cambridge Gas Analyzers continuously analyze and simultaneously record on one chart from one to six constituents of a gas. They may be used for most simple and many complex mixtures of gases. Dependable and labor-saving, these Analyzers make possible increased efficiency and savings in the operation of steam generating plants, cement kilns, blast furnaces; in the production of inert gases; in metallurgy, in petroleum refining and other chemical processes.

Send for literature mentioning application

CAMBRIDGE INSTRUMENT COMPANY INC.

3512 Grand Central Terminal, New York 17, N.Y.

PIONEER MANUFACTURERS OF PRECISION INSTRUMENTS

When inquiring check CP 4314 opposite last page

CHEMICAL PROCESSING

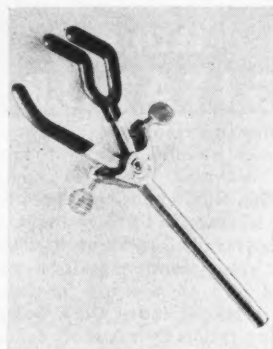
FOR THE LABORATORY

Vinyl gripping surfaces give steady set-ups . . .

lab clamp is made of high-tensile alloy, heavily nickel plated for corrosion

Uses: Standard clamp for lab set-ups. Will hold reaction vessels, other glassware, tubing, burettes, thermometers.

Features: Jaws of lab clamp are hot-dipped in vinyl plastisol. Manufacturer reports this material far superior to his previous rubber sleeve gripping section — better gripping, heat resistance, and aging characteristics have been found.



One of 42 clamps in line

Description:

Three-prong laboratory clamp retains non-rusting, corrosion-resistant construction. Made of alloy with a tensile strength in excess of 47,000 psi, clamps are plated with copper, then heavily with nickel. Alloy

itself is a non-ferrous material. Resulting clamp is resistant to lab fumes and heavy metal salt solutions, alkalis.

Forty-two clamps are included in this line with vinyl surfaces. Manufacturer will continue to supply clamps with woven asbestos jaw coatings as well.

(Castaloy clamps are products of Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. . . or for more information check CP 4315 on form opposite last page.)

Discusses distillation unit for hydrocarbons

Discussing construction and operational features of laboratory distillation units, four-page bulletin includes photographs of units. Distillation units have been developed for determining distillation range of gasolines, naphthas, industrial aromatic hydrocarbons, related petroleum products. Unit described incorporates condenser and distillation shield assemblies so arranged that thermometer and graduate face operator. Prices and other ordering information are included in booklet.

Bul 716 is issued by Precision Scientific Co., Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. When inquiring specify CP 4316 on form opposite last page.



Like nature's porous sponge, Celite has extremely high absorptive capacity. It absorbs 220% of its own weight of water (Gardner-Coleman method)

High absorption

Celite diatomite powders absorb twice their own weight of liquid

Here is a material in powder form, so porous that 93% of its volume consists of tiny interconnected pores. This unique structure gives Celite* an exceptionally high absorptive capacity which is now being put to profitable use in a wide variety of industries. For example, Celite serves as a dry carrier for insecticide poisons . . . helps control viscosity in adhesives . . . and makes a highly effective anti-caking agent in fertilizers.

The unique structure of the microscopic Celite particles offers many other advantages. These particles are spiny and irregularly shaped, strong and rigid . . . as a result they do not pack together.

Thus Celite powders have great bulk per unit weight . . . making them valuable for fluffing up dry powders such as household cleansers . . . and extending pigments in paint and paper.

Celite's physical structure itself is also utilized in many different ways . . . as the outstanding flattening agent for paints . . . as a mild non-scratching abrasive for fine polishes . . . and to improve surface appearance in plastics. And it is also the reason why Celite can add strength, toughness, stiffness, durability and many other desirable characteristics to your product.

If you want improved product per-

formance or lower production costs, investigate industry's most versatile mineral filler. One of the J-M Celite Engineers will gladly discuss your problem. These men are backed by complete technical services and the Johns-Manville Research Center, largest laboratory of its kind in the world. For further information write Johns-Manville, Box 60, New York 16, N. Y. In Canada, 199 Bay St., Toronto 1, Ont.



*Celite is Johns-Manville's registered Trade Mark for its diatomaceous silica products.



Johns-Manville CELITE INDUSTRY'S MOST VERSATILE MINERAL FILLER

When inquiring check CP 4317 opposite last page



How to select filter paper for commercial filtration!

This recently published brochure enumerates dozens of commercial products and processes and tells you the specific grades of E&D filter paper that are most widely used. In most cases, there is a choice of 2 or more grades. This valuable information is free for the asking. Write us for your copy. If your product or process is not included, we will be happy to recommend the best grade for you to try. Free samples for test runs will be made available to you. You can rely on the experience of the only company in America exclusively engaged in the manufacture of filter papers for science and industry.



THE EATON-DIKEMAN CO.
FILTERTOWN
MT. HOLLY SPRINGS, PENNA.

When inquiring check CP 4318 opposite last page

Do You Need ULTRAFINE GRINDING?

FOR UNEXCELLED QUALITY WITH
CONTROLLED PARTICLE RANGE

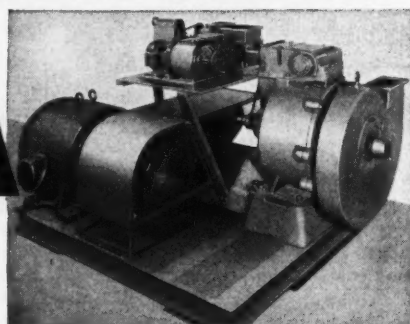
use a
**SCHUTZ-O'NEILL
PULVERIZER**

Backed by 62 years experience!

If your product must be pulverized to ultrafine specifications and yet have controlled particle size distribution, you'll find proven Schutz-O'Neill "Superfine" Pulverizers best for the job.

Many products that are heat sensitive can be pulverized safely too, because the grinding principle of impact with air attrition keeps product temperatures down and helps control humidity.

Versatility of the Superfine Pulverizers makes them adaptable to the complete range of grinding from coarse to ultrafine. Schutz-O'Neill Superfine Pulverizers are used in the paint industry where ultrafine pigments with close particle size range are



vital; by major cocoa powder, sugar, spice and pharmaceutical manufacturers; for emulsifier gums, resin, plastic and seaweed extract powders—wherever unexcelled quality grinding is required. Offered in 6 sizes ranging from 7½ to 125 HP with grinding chambers 12" to 28" in diameter.

FREE TEST GRIND OF YOUR PRODUCT in our test lab! Tell us your milling requirement—fineness, uniformity, increased output, lower cost—send us a sample of the stock you want to pulverize, state fineness and capacity desired. You'll receive back your processed product plus our Engineering Test Report—there's no obligation.

Send for literature on
Schutz-O'Neill Pulverizers



SCHUTZ-O'NEILL COMPANY

343 Portland Avenue • Minneapolis 15, Minnesota

When inquiring check CP 4319 opposite last page

FOR THE LABORATORY

**Improved command structures
give electronic computer
more versatility . . .**

provide for addition, subtraction, division, multiplication and branching

Uses: Solving lengthy and complex problems of research and engineering.

Features: Instrument uses improved two address command structure which gives greatly increased versatility.

Description: Commands provide for addition, subtraction, multiplication and division as well as



branching and other logical operations. Standard input and output devices are furnished with the computer, including an electric typewriter, photoelectric tape reader, mechanical tape punch. As many as four magnetic tape units may be used to store an additional 600,000 words.

Cabinet is 27 x 30 x 60". Power requirements are 3 kva. Unit is mounted on casters for easy relocation.

(Computer is product of Bendix Computer Div., Bendix Aviation Corp., Dept. CP, 5630 Arbor Vitae Street, Los Angeles 45, Calif. . . . or check CP 4320 on form opposite last page.)

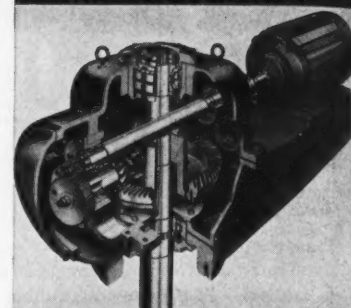
**Controls individual Kjeldahls
with separate rheostats
on digester . . .**

unit is designed for individual micro determinations of 30 ml

Uses: For micro determination of nitrogen in organic compounds by Kjeldahl's method.

Features: Separate controls permit variable heat

COMPARE the Construction



of Philadelphia FLUID AGITATORS

Exclusive Low Head Room Design— maximum bearing span with minimum headroom • Helical Change Gear Set, within housing, allows for ready selection of up to 14 standard speeds • Heavy Duty Thrust Bearings permit use of standard units for conditions of high pressure in closed tanks • Large Heavy Duty Output Shafting results in less shaft deflection at stuffing box or mechanical seal, steady operation of long overhung agitator shafts • Heavy Duty Inboard Bearing Support provides extra rigidity resulting in superior gear performance and life • Spiral Bevel Gears of Hardened Steel, accurately lapped for long and quiet operation • Field-proven Dry-Wall Construction prevents oil leakage down output shaft • Labyrinth-type seal on input shaft allows effective sealing with minimum friction • . . . Plus a complete Fluid Agitator Engineering Service, backed by over 62 years of experience.

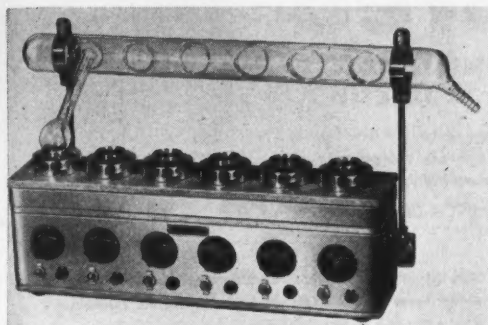


Write for
Bulletin
A2-55.



When inquiring check CP 4321
opposite last page

CHEMICAL PROCESSING

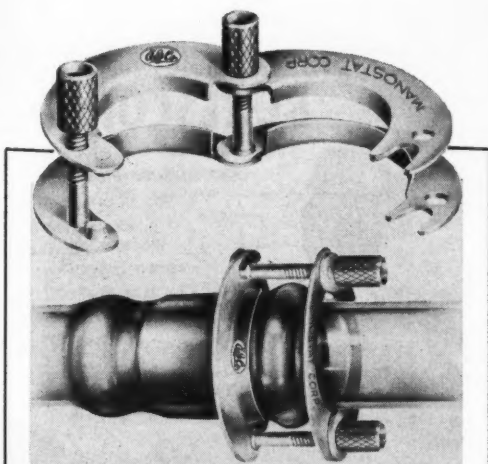


Separate controls permit variable heat

for each of digester's six units.

Description: Digestion unit has bank of six individual electric heaters with individual rheostat control. Digester is designed to be used with 30 ml flasks. Cabinet is stainless steel and is 19 x 4 x 7½". Heat insulation is provided by highly compressed asbestos. Heater uses 150w at 115v.

(Micro-Kjeldahl digester is product of Laboratory Construction Company, Dept. CP, 1115 Holmes St., Kansas City, Mo. . . or for more information concerning this product reader may simply check CP 4322 on form opposite last page.)



Eliminates hooks and springs in clamping TS joints

Aluminum joint clamp eliminates need for hooks and springs in connecting taper joints. Clamp is small, compact, one-piece unit and is designed to fit all makes of standard taper TS joints. Clamp provides a positive lock. A simple screw adjustment controls clamping pressure. The clamps may be attached to apparatus already set in place.

(Joint clamps are product of Fairfax, Inc., Dept. CP, 17 E. 49th, New York 17, N. Y. . . or check CP 4323)

High Speed Reduction to Micron Sizes — No Attritional Heat!



Production Model
(15 in. diameter grinding chamber)

Laboratory Model
(2 in. diameter grinding chamber)

ENGINEERING FLUID-JET GRINDING IN "PACKAGE UNITS"

... comes naturally to Sturtevant engineers — with their 75-year tradition of successful solving of dry-processing problems. If you want to accomplish the most effective grouping of a Micronizer* Grinding Machine with necessary compressor, feeder and dust-collector, it will pay you to investigate. Check the coupon on the right for more information.

Sturtevant Micronizer* Grinding Machines Give Greater Finenesses than Tube or Roller Mills

Look at the record! 30 inch model reduced titanium dioxide to 1 micron and finer at solid feed rate of 2250 lbs. per hr. 24 inch model reduced DDT (50%) to 3.5 average microns — 1200-1400 lbs. per hr. 8 inch model reduced Procaine—Penicillin—to 5 to 20 microns—up to 20 lbs. per hr. Couldn't you use milling performances like these?

No moving parts. The particles grind each other. High-speed rotation and violent grinding impact of particles are caused by jets of compressed air or steam at angles to the periphery of the shallow grinding chamber. There are

no problems of attritional heat. Centrifugal force keeps over-sized particles in the grinding zone. Cyclone action in the central section classifies and collects the fines for bagging.

Instant accessibility, easy cleaning. Micronizer* Grinding Machines come in seven sizes — each one constructed for quick accessibility and easy maintenance (typified by the "OPEN DOOR" design in other Sturtevant equipment). Grinding chambers range from the 2 in. laboratory size with ½ lb. per hr. capacity to the 30 in. size which handles up to 3000 lbs. per hr.

* Registered trademark of Sturtevant Mill Co.

STURTEVANT

Dry Processing Equipment

The "OPEN DOOR" to lower operating costs over more years

CRUSHERS • GRINDERS • MICRON-GRINDERS • SEPARATORS
BLENDERS • GRANULATORS • CONVEYORS • ELEVATORS

My dry-process materials are:

Desired capacity is:

Name _____ Title _____

Firm _____

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STURTEVANT MILL COMPANY 119 Clayton Street, Boston 22, Mass.

Please send me your Micronizer* Bulletin ☐

Also bulletins on machines for:

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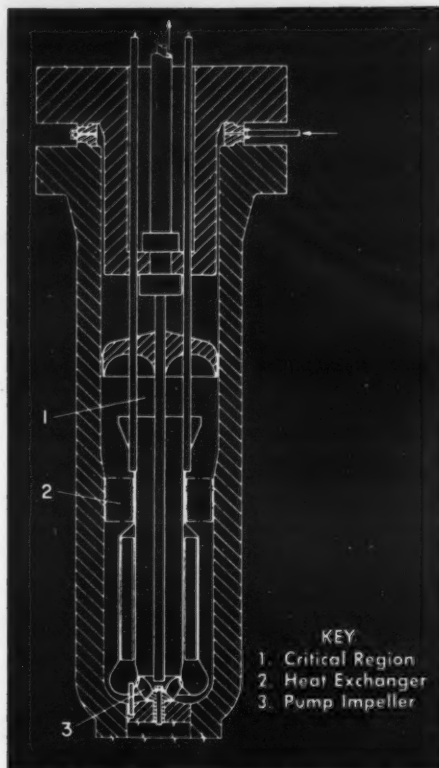
☐ SUPERFINE SELECTING

☐ GRANULATING

☐ CONVEYING

When inquiring check CP 4324 opposite last page

1 of 5



This simplified drawing of an experimental homogeneous type power reactor, now in the final assembly stage, shows one of five nuclear reactor projects currently under way at Los Alamos, where the world's first homogeneous reactor was designed and built and is still in operation.

Indicative of the importance of these experiments is the Laboratory's thirteen year record in active research, design and development in this major field of basic scientific interest.

Many challenging projects in nucleonics, physics, chemistry, metallurgy, mathematics and engineering support these as well as other of the Laboratory's diverse activities.

Top-level scientists and engineers interested in long-range career opportunities at one of the nation's foremost scientific laboratories can secure complete information by writing

DEPARTMENT OF SCIENTIFIC PERSONNEL
Division 602

los alamos
scientific laboratory
OF THE UNIVERSITY OF CALIFORNIA
LOS ALAMOS, NEW MEXICO

LABORATORY

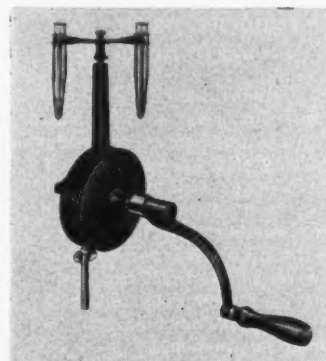
**Has aluminum body
to increase ease
in carrying . . .**

hand centrifuge has top
speed of 2000 rpm

Uses: As portable centrifuge
with relatively high speed.

Features: Weight of hand
centrifuge has been reduced to
one-half that of previous models.

Description: Body is alumi-
num alloy die casting. Shaft
which supports the centrifuge
head is a steel pinion gear, rest-
ing on a steel ball bearing and
held in position with two bronze



Centrifuge has one-piece body

bearings. Shaft engages a brass
beveled gear which drives the
pinion in a ratio of 16:1. Steel
driving shaft runs in bronze
bushing.

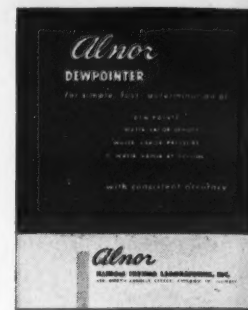
Housing is dust-proof and packed
with grease for noiseless opera-
tion. Aluminum crank has spring
clutch to absorb driving power
shock. Clutch disengages when
power ceases. Centrifuge has top
speed of approximately 2000
rpm. Two tube holders are de-
signed for 15 ml tubes. Centri-
fuge conforms to ASTM speci-
fications D96; US Government
Spec VVL-791; Bureau of Mines
Paper 323B.

(Model 1160 Hand Centrifuge is
product of Wm. Boeckel & Co.,
Inc., Dept. CP, 509-19 Vine
Street, Philadelphia 6, Pa. . . or
for more information check CP
4325 on form opposite last page.)

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ALNOR DEWPOINTER!



Only the Alnor Dewpointer has a sealed testing chamber, where
atmospheres can be analyzed under controlled conditions . . .
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readings. Completely self-contained and readily portable for
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obtain precise results, time after time.

Tear out this ad and send it along with your business letter-
head to Illinois Testing Lab-
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Models available for inspection of cavities
of any size from 1/8" diameter up,
and in any length up to 70 feet.
Precision optical systems and built-in
illumination give bright, clear image
for visual or photographic inspection.

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New York Office
30 CHURCH STREET, NEW YORK 7, NEW YORK

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CHEMICAL PROCESSING

**NEED A
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*Here's a new
compound
to consider...*

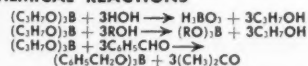
**ISOPROPYL
BORATE**

We suggest this new Trona organo-boron compound as an important aid in your current or future research and development studies. Available in drum quantities for the first time.

PROPERTIES

Molecular weight: 188.08
Percent boron: 5.75
Boiling point: 139-140°C @ 760 m.m.Hg.
Density: 20°/4°C - 0.825 gms./ml.

CHEMICAL REACTIONS



Write today for technical information—
Sales Development Department



**American Potash &
Chemical Corporation**

3030 West Sixth Street
Los Angeles 54, California
99 Park Avenue, New York 16, New York

When inquiring check CP 4328
opposite last page

MARCH 1956

FOR THE LABORATORY

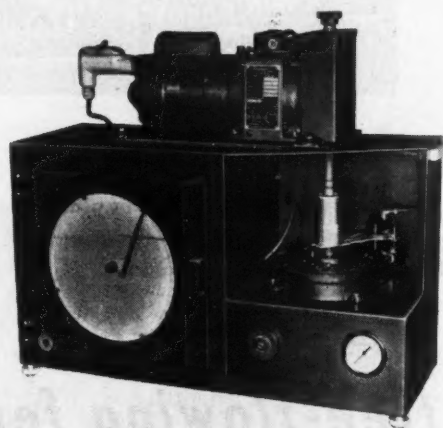
**Uses pneumatic system
to measure viscosity
of slurries**

Measures force by automatically
supplying a counter-balancing force

Uses: Testing flow properties of pigment suspension in manufacture of paper, as well as paints, printing inks and some plastics.

Features: Viscometer uses pneumatic system instead of springs to measure shearing force. Range changing is simplified and the instrument is substantially free of mechanical hysteresis.

Description: Unit consists of variable-speed transmission with variable-speed motor, stationary sample cup and driven bob, torque-measuring component and recording ring-balance gage. Counter-balancing force supplied by pneumatic



Ring-balance gage, at left, records rate of shear

pressure upon a known area is measure of torque developed by viscous drag. Torque-measuring component is supplied with air under constant pressure and mechanically coupled to sample cup. Output air pressure, or viscous drag, is recorded by ring-balance gage which simultaneously records rate of shear.

Maximum rate of shear developed is 9000 reciprocal seconds. Minimum viscosity measureable is about 0.3 poise; maximum is about 12 poises. Instrument is calibrated by checkweights in terms of dyne-cm torque.

(Hagan viscometer is product of Hagan Corporation, 323 Fourth Ave., Pittsburgh 30, Pa. . . or for more information reader may simply check CP 4329 on the convenient Reader Service slip which is located opposite last page.)

**Explosion proof pump unit
Eco pump and air motor**



The leaders in small pump design, ECO ENGINEERING now offers a new, portable explosion-proof variable speed pumping unit.

This compact unit combines the time-tested ECO All Chem Pump with a manually controlled variable speed air motor.

It's the safest combination for handling hazardous or corrosive fluids and was designed for labs, pilot plants, chemical process plants, pharmaceutical and nuclear installations.

The ECO All Chem Pump is self-priming with non-volatile fluids and is readily available in a variety of construction materials suitable for dependable, low-cost pumping of non-abrasive fluids.

ECO can make immediate shipment of the complete unit in capacities from 0 to 10 GPM and pressure to 100 PSIG.

CALL OR WRITE US TODAY!

All-Chem *the big name in small pumps*
PUMPS
ECO
ENGINEERING COMPANY
12 NEW YORK AVE., NEWARK, N. J.

When inquiring check CP 4330 opposite last page

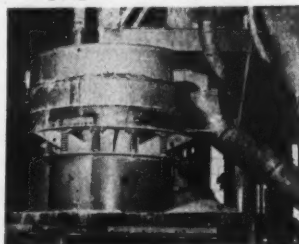
SCREENING NEWS



Colgate Puts 6 Tons/Hr. of FAB and VEL thru a 48" SWECO

Colgate-Palmolive, S. A., Mexico, D. F., the largest producer of detergents in Central America, now screens upwards of 6 tons per hour of FAB and VEL with a 48" dia. SWECO. The material is conveyed directly to a special feeder over the center of the SWECO Separator. Oversize and lump (plus 8 mesh) materials are returned to processing for 100 per cent recovery, while minus 10 mesh product is conveyed to the Packing Department.

Production Control reports improved uniformity, throughput beyond anticipated capacity, and a sharp drop in maintenance costs. Customer comment: "... results are highly satisfactory."

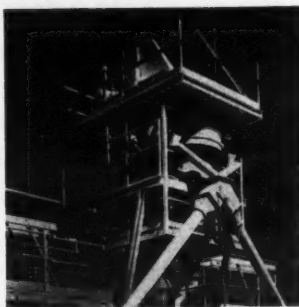


COLGATE DETERGENT SCREENING operation in Mexico City Plant. Plus 8 mesh material is reprocessed; minus 10 is packaged.

SWECO Eliminates Screen Blinding— Cleans Catalyst Pellets for Filtrol

Filtrol Corporation, Salt Lake City, Utah, had been using a conventional rectangular shaker screen to remove "fines" from extruded catalyst pellets. Maintenance was high due to screen blinding and the difficulty of cleaning the equipment.

The Company now obtains high capacity output from its 48" dia. SWECO Vibrating Screen Separator. The Separator cleans all "fines" from finished TCC grade pellets without blinding.



FILTROL'S CATALYST CLEANING SWECO can be lightly mounted "upstairs." There is no imparted vibration to substructure.

Free screening analysis and recommendations...

Your nearby SWECO District Engineer is available to help you with special screening problems. His know-how covers 241 different materials... wet or dry, coarse or fine, heavy or light.

SEND FOR DATA FILE 65-3

Detailed information on high-efficiency, low-cost applications of SWECO Screen Separators.

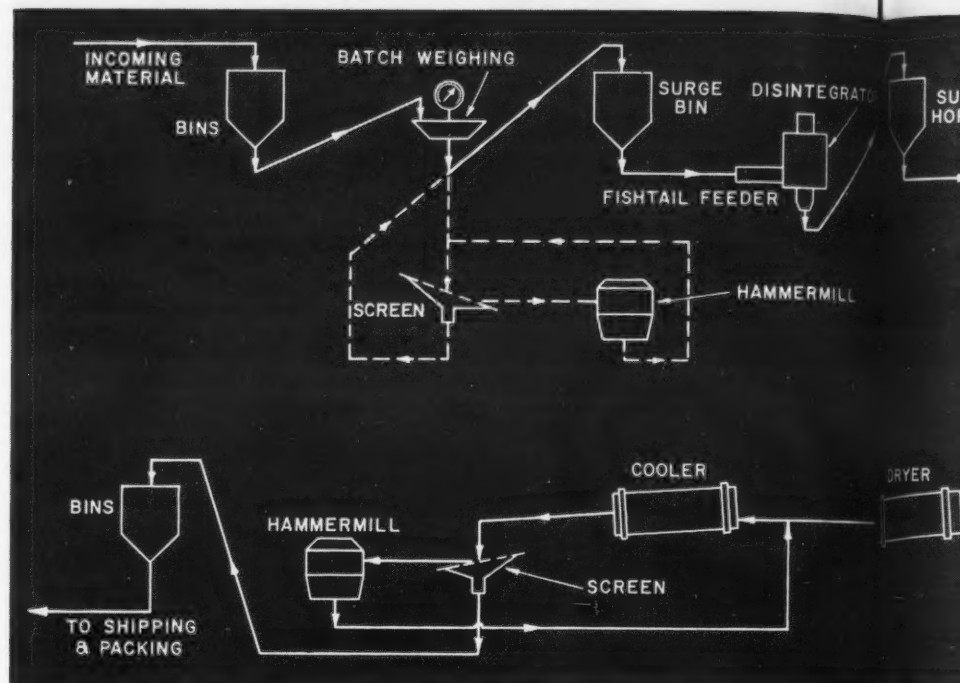


**SOUTHWESTERN
ENGINEERING
COMPANY**

4800 Santa Fe Ave., Los Angeles 58
LOgan 8-6262—Cable: sswcola

Engineers and Constructors... Manufacturers

processing equipment



Flow diagram illustrates process changes made in chemical fertilizer plant. Superseded steps are shown by dotted lines.

Disintegrator plays key role in solving fertilizer plant's production problems. Unit eliminates product segregation, stops hammermill plugging, and helps produce...

uniform, free-flowing fertilizer

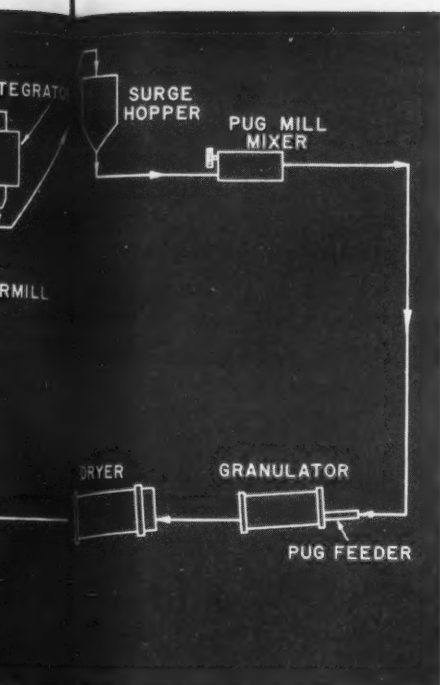
TED F. MEINHOLD, Assistant Editor
Verified by DR. JOSEPH A. CHUCKA,
Fertilizer Research Department
Eastern States Farmers Exchange

Problem: Eastern States Farmers Exchange (a farmer's cooperative) was having a difficult time trying to maintain a uniform free-flowing product at its Wilmington, Delaware, fertilizer plant. Overall analyses would vary, and at times, the finished product would set up in bins to such an extent that power shovels were needed to scoop it out. Plant produces fertilizers made from nitrogen solutions, super-phosphates, potash, and other ingredients. Capacity is around 20,000 tons/yr.

Solution: Detailed study of the problem revealed that the cause was twofold: 1) segregation occurring at shaker screen and hammermill (located at beginning of manufacturing process) accounted for the changes in composition, and 2) large chunks emerging from cooler at end of process were not thoroughly dry—causing the clogging in bins. The segregation was brought about by the fact that the rejected lumps of material (mostly superphosphate) from the screen were passed through the hammermill before rejoining main stream of ingredients. The milled material never quite caught up with the main batch. Further complications arose because mill had tendency to plug up at regular intervals.

Engineers replaced the screen and hammermill

When inquiring check CP 4331 opposite last page

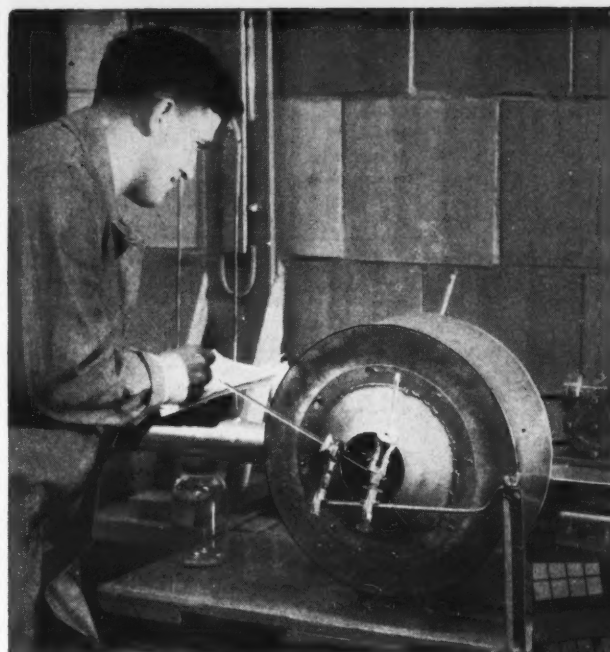


Fishtail feeder (arrow), gives product preliminary mixing before it passes to Disintegrator (left)

with a Rietz vertical Disintegrator (see *CHEMICAL PROCESSING*, April 1954, p. 126) — the object being to finely grind the batch and at the same time impact mix for uniformity. Unit has fixed hammers each held rigidly between flanges by two stainless steel, one-piece rotor pins. Swing-door body affords dust and water-tight seal and facilitates screen and hammer changing. Machine also features full 360° screen area, with close clearance between screen and hammers. This provides a full working area and prevents build up and plugging.

In addition to the Disintegrator, a Rietz fishtail

(Please turn to next page)



In fully-staffed, modern laboratory, miniature equipment is used to test small batches sent to Link-Belt.

Full-scale facilities are used for large runs. Over 1000 of these tests have been made, on more than 100 products.

We'll work out drying, cooling or roasting procedures for you

WHAT'S the best drying, cooling or roasting method for processing your materials? Hundreds of plants throughout the world have found an exact, detailed answer through Link-Belt test runs. Here's how it works:

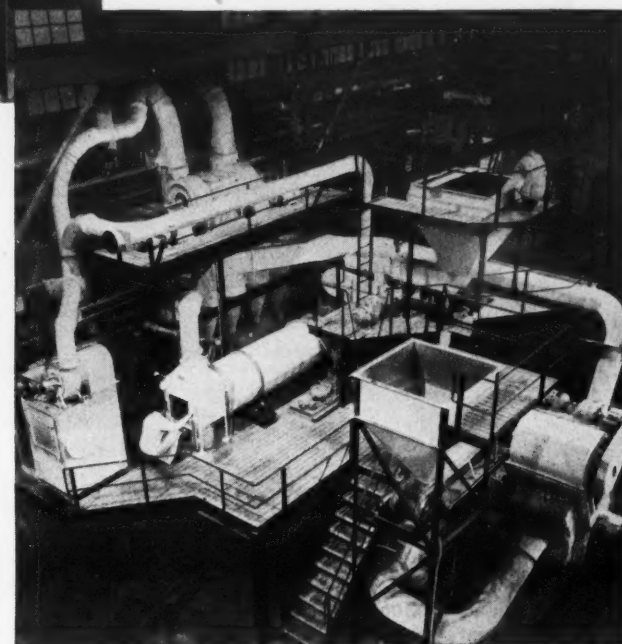
- You send a representative sample of your product — a pound or a ton — with a complete description . . . covering initial moisture, critical temperatures and your merchandising objectives.
- On equipment like that shown above, our specialists conduct test-runs — find how to blend, compound or convert it to desired chemical composition. Our analytical laboratory will determine needed catalyst or agents to be added, if tests so indicate.
- With probable efficiencies decided, we'll lay out flow charts of methods you can follow in your own plant.

If shipping your product is impractical, we'll gladly set up a pilot unit on loan at your plant. Write or send samples to LINK-BELT COMPANY, 300 West Pershing Road, Chicago, Ill.

YOU'RE INVITED

to send us a sample
of your material

... a pound
← or a ton ...



LINK-BELT

DRYERS • COOLERS • ROASTERS



ROTO-LOUVRE

MULTI-LOUVRE

OSCILLOUVRE

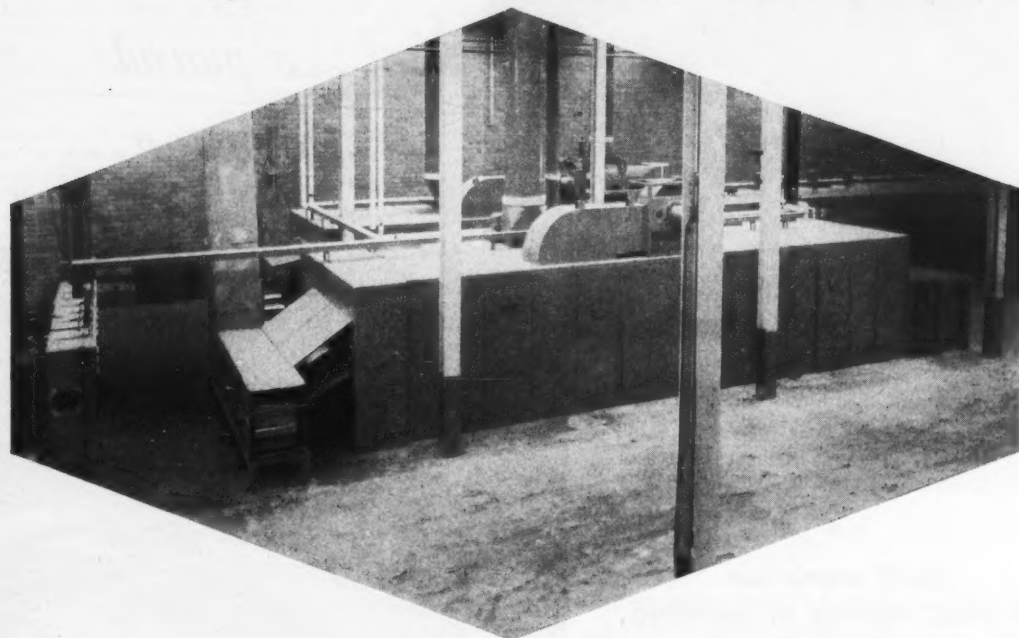
MONOTUBE

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants and Sales Offices in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,792

When inquiring check CP 4332 opposite last page



DRYING RANGE means HIGHEST PRODUCT UNIFORMITY!



Efficient drying per pound of product can often mean more direct profit to you than an increased sales volume! Proctor equipment provides the control, flexibility, and construction features essential to profitable drying performance. The result—increased yield of highest quality product. Write or phone today for complete information.

Product Uniformity is of utmost importance to every food processor, at all stages of processing.

Shown above is one of many Proctor & Schwartz dryer installations in one of the country's larger food plants—typical of the many in use in the food industry today. Here, because of Proctor drying skills, uniformity of color, taste, and overall customer appeal is maintained at uniformly highest levels—yields are greatly increased!

- ★ PROFITABLE OPERATION
- ★ INCREASED YIELD
- ★ GUARANTEED PRODUCT QUALITY
- ★ "W/M" CONSTRUCTION
- ★ FLEXIBILITY OF OPERATION

PROCTOR DRYING EQUIPMENT FOR THE FOOD AND PROCESS INDUSTRIES

- Tray Dryers
- Truck Dryers
- Pre-Forming Feeds
- Continuous Conveyor Dryers
- Spray Dryers



PROCTOR & SCHWARTZ, Inc.

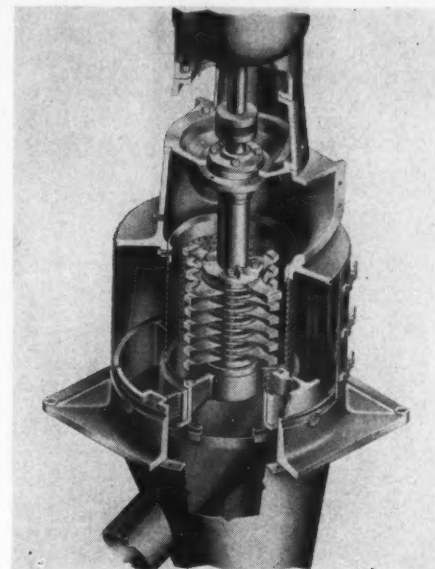
Manufacturers of Industrial Drying
Equipment and Textile Machinery,
Philadelphia 20, Pa.

When inquiring check CP 4333 opposite last page

PROCESSING EQUIPMENT

Fertilizer Process

(Continued from preceding page)



Cutaway view shows "business end" of vertical Disintegrator. Close clearance between screen and hammers provides full working area and prevents build-up of material

feeder was also installed to withdraw material from surge bin. Feeder gives material preliminary mixing before it passes to the Disintegrator. Bin-clogging was solved by installing a scalping screen and hammermill immediately after the cooler. Mill handles oversize from screen and returns the ground tailings to the drying system. Screen eliminates all lumps and assures uniform ground material passing to final bins.

Results: By means of these changes, plant now produces a constantly uniform, free-flowing product. Segregation no longer presents a problem because the entire batch passes through the Disintegrator where it is thoroughly impact mixed.

(Model RD-18-H32 Vertical Disintegrator and fishtail feeder is product of Rietz Manufacturing Company, Dept. CP, 150 Todd Road, Santa Rosa, California . . . or check CP 4334 opposite last page.)

Engineering services described

Equipment and plants for chemical and food processing industries are listed and pictured in 12-page catalog. Available engineering, construction, and procurement services are also outlined.

Cat 2489 is issued by Export Department, Blaw-Knox Company, Dept. CP, 408 Lexington Ave., New York 17, N.Y. When inquiring specify CP 4335 on form opposite last page.

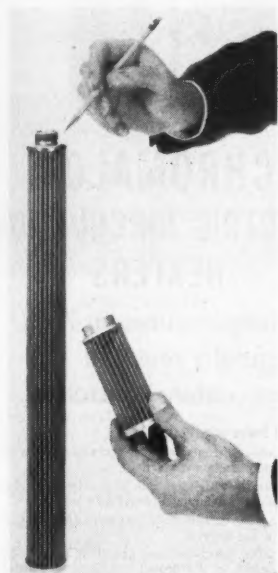
Fluids up to 1000°F handled by sintered metal filter

Will remove particles as small as one micron

Uses: Filtering various liquids, including nitric, hydrochloric, sulfuric, and phosphoric acids, and strong alkalis.

Features: Filter will remove particles as small as one micron and will handle fluids up to 1000°F.

Description: Element is one-piece, radial-finned, sintered. Construction is of stainless, Monel, or other metal — depending upon application. It can be made in a variety of diameters and lengths. Any number of convolutions, of any specified depth, can be supplied to give desired extended area. Porosity can be varied as to pore size and flow rate desired. Element withstands differential pressures up to 500 psi.



Sintered metal filter element can handle differential pressures up to 500 pounds per square inch

Internal or external threaded connections may be provided. Threads are used as seals to overcome necessity of using packings. For extremely high-temperature applications, connections and elements are made into a single unit. Filter can be cleaned by back-flushing. (Sintered metal filters are product of Purolator Products, Inc., Dept. CP, Rahway, N. J. . . . or check CP 4336 opposite last page.)

Chemical processing equipment described in bulletin

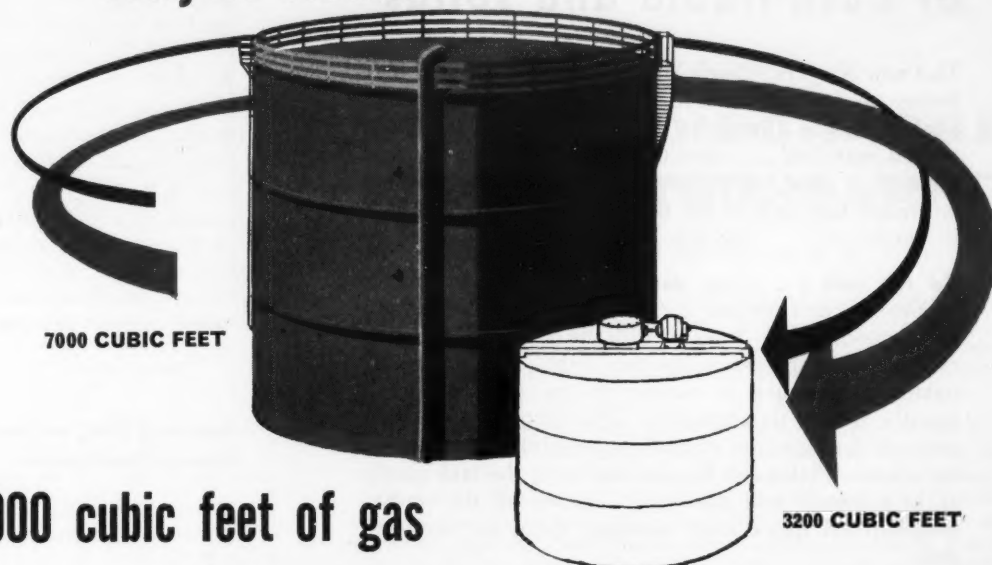
Various types of chemical processing equipment are described in illustrated 20-page brochure. Included are sections on dryer-kilns, heat exchangers, evaporators, high-temperature heating, crystallization equipment, mixing equipment.

Bul 559CN is issued by Struthers Wells Corp., Dept. CP, Warren, Pa. When inquiring specify CP 4337 on form opposite last page.



**TURBO-MIXER, a division of
GENERAL AMERICAN TRANSPORTATION CORPORATION**

every 60 seconds...



**7000 cubic feet of gas
dispersed in
3200 cubic feet of liquid
—with TURBO on the job**

If absorption of gas into liquid is your problem, put Turbo to work. Turbo Gas Absorbers handle up to 7000 cfm with proved operation. They are available in sizes up to 84"—the largest mechanical gas absorbers in operation. What's more, only Turbos can be designed to self-induce gas into the liquid.

Turbos can solve your agitation problems, whether your business is petroleum processing, chemicals, pharmaceuticals or minerals beneficiation. Turbo's built-in ruggedness that provides continuous 24-hour heavy-duty service assures you of "headache-free" production and lower costs in the long run.



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TOWERS • TANKS • PRESSURE VESSELS**

When inquiring check CP 4338 opposite last page



NOW!

**100 %
RECOVERY**

of both liquid and solids

This new Niagara "Batch Miser" Horizontal Plate Filter leaves no heel at the end of the cycle. Slurry flows under pressure directly to the individual plates from a central manifold . . . then through the filter medium or filteraid . . . and into the tank. With other designs there is always heel left in the tank unless a scavenger leaf is employed.

No tie rods . . . less down-time Plates fit snugly together at the rims and are held tightly in this position by a pressure ring. Integral with the cover, the pressure ring bears on the rim of the top plate. As the cover is tightened, pressure is exerted on the plate assembly equally around its perimeter. This simple construction prevents leakage and eliminates possibility of warping the plates. Plates can be removed from the tank singly or in a bundle and are easily slipped off the central manifold for quick cake removal. Send for complete data.

MAIL COUPON TODAY

Niagara FILTERS

A DIVISION OF

American Machine and Metals, Inc.

Dept. CP-356, EAST MOLINE, ILLINOIS

- ☐ Send Bulletin with complete data on the new Niagara "Batch Miser" Horizontal Plate Filter for handling.
- ☐ Have representative call.

NAME & TITLE

COMPANY

ADDRESS

CITY

ZONE

STATE

Specialists in Liquid-Solids Separation

When inquiring check CP 4339 opposite last page

PROCESSING EQUIPMENT

Floating blades cut film thickness, contact time on evaporator heating surface

A new continuous, turbulent, floating-blade evaporator, permitting thinnest possible films on the heat transfer cylinder and smaller amounts of material in process, has been developed. Unit is said to be ideal for concentrating heat-sensitive solutions from which a mixture of crystals and liquor is desired. In some cases, it is possible to dry powder.

Unit is similar to manufacturer's regular Turba-Film evaporator except in one respect; blades of the rotor are pivoted so that they ride on a thin film of liquid flowing down the heat transfer cylinder. Because of the wiping action of the floating blades, the action of the heating medium on the thinly distributed product is reduced to a matter of seconds for each particle.

Blades can be constructed of metal, nylon, Teflon, or other materials. Evaporator is available in seven sizes with cylinder diameters of 4 to 36" and heating areas of 1 to 200 sq ft.

(Turba-Film floating-blade evaporator is product of Rodney Hunt Machine Company, Dept. CP, Orange, Mass. . . or for more information check CP 4340 on convenient Reader Service slip which is located opposite last page.)

Removes 99% of low-micron dust from exhaust gases . . .

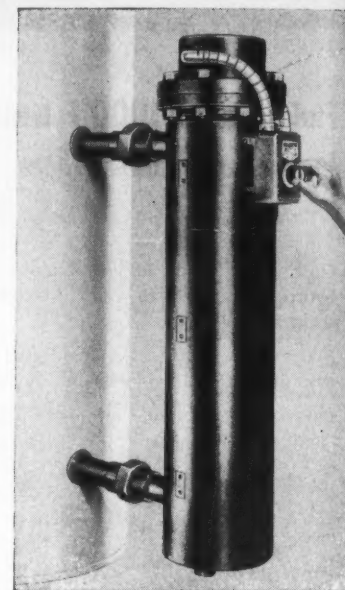
scrubber collects dust by hydro-compressing gases through system of tubes into water chamber

Uses: Removing microscopic solids, fumes, and odors from exhaust gases.

Features: Scrubber has operated at 99 percent efficiency in tests using dust loadings of five grains per cubic foot, with 70 percent of material below five-micron particle size. Water recirculation system keeps water demand to minimum.

Description: Scrubber is self-contained unit, consisting essentially of the following components: 1) plenum chamber, 2) multiple-tube section, 3) water reservoir, 4) de-watering filter, and 5) exhaust fan.

Operating cycle begins with the entry of the dust-laden gas into the plenum chamber. Entrained solids are immediately wetted by sprays of water coming from nozzles located at top of chamber. Gas moves downward, compressing as it passes through tubes, which extend below water surface in reservoir. Resulting high velocity creates violent turbulence in the water. Solids are thoroughly wetted, trapped, agglomerate, and settle to bottom. Scrubbed gas passes through de-watering filter and is exhausted through fan into atmosphere.



CHROMALOX ELECTRIC CIRCULATION HEATERS

Temperatures to 750°
rapidly reached . . .
accurately controlled

You get these advantages—

Automatic, self-contained heat exchanger that is easy to install, operate and maintain.

- Pre-engineered design with built-in insulation, thermostat and mounting provisions.
- Two pipes connect it . . . two wires energize it. Set it and forget it.

Dependable, round-the-clock operation. Ideal for converting steam or gas heated equipment to automatic electric operation.

Savings that more than pay cost of installation.

For these uses—

Preheating oil—heating water—generating, superheating and drying steam—heating process kettles and tanks—heating Dowtherm, Aroclor, Prestone and similar heat transfer liquids—heating air, nitrogen and other gases.

Let the Chromalox Sales-Engineering staff solve your heating problems . . . electrically.

Write today for your copy of Bulletin 701

. . . to get complete information on Chromalox electric heat exchangers and applications.

For information on complete line of Chromalox electric heaters, elements, thermostats, contactors and switches—request Catalog 50.

Edwin L. Wiegand Company

7517 Thomas Boulevard, Pittsburgh 8, Pa.

Edwin L. Wiegand Company
7517 Thomas Boulevard, Pittsburgh 8, Pa.
I would like to have . . .

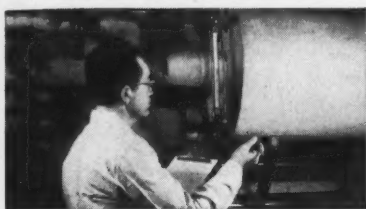
- ☐ a copy of Bulletin 701.
- ☐ a copy of Catalog 50.
- ☐ a Sales-Engineer contact me.

Name _____
Company _____
Street _____
City _____ Zone _____ State _____

When inquiring check CP 4341
opposite last page

CHEMICAL PROCESSING

what do you want to see?



WATER LEVEL?

Pressures to 100 p.s.i.—CORNING brand STANDARD gauge glasses. To 300 p.s.i., and high temperatures—PYREX brand HIGH-PRESSURE gauge glasses. To 300 p.s.i., and corrosive conditions—PYREX brand HEAVY-WALL gauge glasses. For greater visibility—PYREX brand RED-LINE gauge glasses. 350 to 5000 p.s.i. (and higher in some cases)—MACBETH brand FLAT gauge glasses.



INTO HIGH-PRESSURE, HIGH-TEMPERATURE VESSELS?

PYREX brand SIGHT GLASSES give you typical advantages of PYREX brand glass No. 7740—high thermal shock resistance, chemical stability, physical stamina, clear visibility, resistance to clouding.

LUBRICATION LEVELS, OIL LEVELS?

PYREX brand lubrication and oil-cup glasses—long-lasting, chip-resistant, easy to install. Accurate dimensions insure a snug fit.

Your Industrial Distributor has a complete line of Corning quality gauge glasses—let him help you select the types which will best serve your needs. Call him today.

CORNING INDUSTRIAL GLASSWARE FOR EVERY JOB

Application	Recommended Product
Normal Conditions (Up to 100 p.s.i.)	CORNING brand standard gauge glasses
Higher temperatures	PYREX brand high-pressure gauge glasses
Higher pressures	PYREX brand heavy-wall gauge glasses
Extra visibility	PYREX brand red-line gauge glasses
Viewing inside furnaces, reactors pressure vessels, etc.	PYREX brand sight glasses
Lubrication inspection	PYREX brand lubricator glasses
Visible discharge devices	PYREX brand oil cup glasses



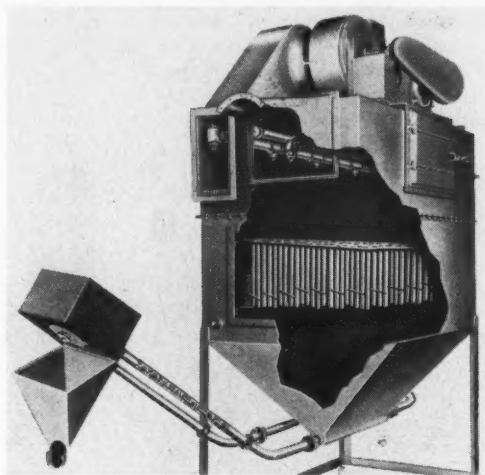
CORNING GLASS WORKS
Corning, New York

Corning means research in Glass

When inquiring check CP 4342 opposite last page

PROCESSING EQUIPMENT

Water is continually recirculated through scrubber by means of a pump. Proper water level is maintained by an overflow weir. Needle valve on fresh water supply controls makeup water. Collected sludge can be removed intermittently or continually by manual, hydraulic, or mechanical means. Last method consists of a tube flight conveyor designed so that it can be extended, to a convenient discharge point (see photo).



Cutaway shows interior of scrubber. Spray nozzles can be seen near top of chamber. Tubes are at center. Sludge removal conveyor is optional

Scrubber is available in 15 sizes, with capacities ranging from 500 to 40,000 cfm. Normal construction is steel, but units can be built of special corrosion-resistant materials if desired.

(Type-A Hydro Precipitator Scrubber was developed by The Johnson-March Corporation, Dept. CP, 1724 Chestnut, Philadelphia, Pa. . . . or for more information about manufacturer's product reader may simply check CP 4343 on form which is located opposite last page.)

Describes solenoid pilots for off-on control

Listing reasons for economies in off-on control with solenoid pilots, four-page bulletin in two color describes applications. Schematic diagrams of typical applications are included. Material of construction, maximum pressure, and maximum temperature recommendations are given for two and three-way pilots in steam, air, gas, and liquid service.

Bul Form 1010 is issued by Spence Engineering Company, Dept. CP, Walden, N.Y. When inquiring specify CP 4344 on form which is located opposite last page.

NEW
Centrifugal



BOTTOM DISCHARGE *Plus* CENTER-SLUNG® SUSPENSION . . .

unloads fast This new Tolhurst Batch-Master Centrifugal discharges solids through the bottom in seconds . . . saves unloading time . . . speeds up production cycles. In fact, it's the fastest unloading centrifugal there is. The bottom opening is 25% larger than on any other machine.

handles unbalanced loads Batch-Master is constructed with Tolhurst's exclusive "Center-Slung" design. The points of suspension on the case are in a plane which passes through the center of gravity of the rotating basket and load. This reduces the overturning effects of unbalanced loads and allows the rotating mass to find its own center of gyration. Thus "Center-Slung" centrifugals handle 3 to 4 times greater out-of-balance loads than ordinary machines. So Batch-Master runs smoothly—with vibration largely eliminated, bearing stress relieved.

Sizes are 40" and 48" . . . in choice of corrosion-resistant materials . . . perforate or imperforate baskets. Send for full data.

MAIL COUPON TODAY

Tolhurst CENTRIFUGALS

A DIVISION OF

American Machine and Metals, Inc.

Specialists in liquid-solids separation.

DEPT. CPT-356 EAST MOLINE, ILLINOIS

- ☐ Send data on new Batch-Master.
☐ Have a representative call.

NAME AND TITLE _____

COMPANY _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

When inquiring check CP 4345 opposite last page

ALL OVER THE WORLD

**In the Plants
of One Company**

The pictures shown here are of Abbé Dispersall Mixer installations in a few of the foreign plants of a world-famous manufacturer of cosmetics. There are many more. These mixers are used in the manufacture of tooth and other pastes.

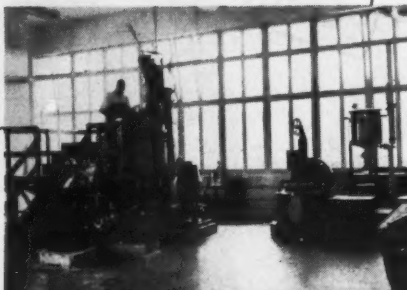
The fact that this company has adopted Abbé Dispersall Mixers for pastes in its foreign plants (as well as in its domestic factories) is ample evidence of the superior performance of these mixers.

Here's What They Say About These ABBÉ DISPERSALL MIXERS:

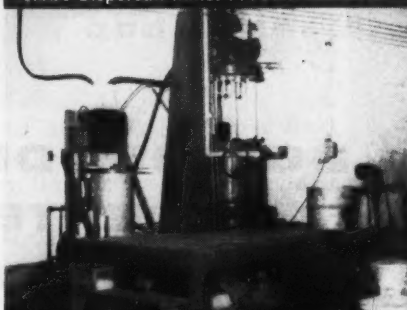
"They have met our requirements for a versatile piece of equipment suitable for relatively small scale production. They have the valuable quality of being easy to clean, which, as you can appreciate, is a decided advantage when more than one product is made in the same machine."

If You Are Mixing Liquids or Pastes...

ask us for a recommendation, as well as full details on the advantages of the Abbé Dispersall Mixer.



Abbé Dispersall Mixer ... SWITZERLAND



Abbé Dispersall Mixer ... COLOMBIA



Abbé Dispersall Mixer ... VENEZUELA



Abbé Dispersall Mixer ... DENMARK

ABBÉ ENGINEERING COMPANY
50 Church Street • New York 7, N. Y.
Address Department 46

When inquiring check CP 4346 opposite last page

PROCESSING

**Offer completely automatic
freeze-drying system
as pilot plant...**

instruments hold and plot
material, shelf temps

Uses: Pilot plant and other small-scale-production freeze-drying applications.

Features: Unit is a complete freeze-drying system equipped with automatic controls. Unit has recording instrument which plots both material and shelf temperatures, so that conditions can be duplicated in large-scale plant.

Description: Plant consists of a 6000-ml-water-capacity vacuum dehydration system, shelf heating and cooling system, two-stage Freon-12 condenser refrigeration system, and control center.

Stainless steel drying cabinet is evacuated by 30-cfm two-stage rotary gas ballast pump. Ultimate vacuum produced is lower than one micron. Ethylene glycol is used to freeze material and also to heat frozen material for drying.

Glycol is cooled by 1/2-ton refrigeration system and heated by 6000-watt heater. Controller holds condenser temperature constant at selected values between -75° and -55°F. Overall dimensions of freeze-drying unit are 6'x13'6"x6'4" high. Shelf dimensions measure 18"x20".

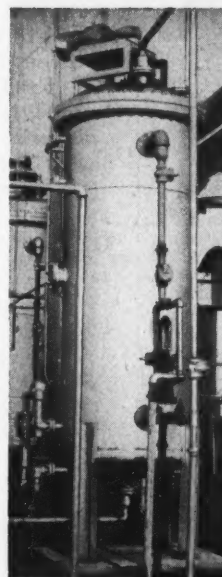
(Model 3506 freeze drying system is product of Naresco Equipment Corp., Sub. of National Research Corp., Dept. CP, 160 Charlemont St., Newton Highlands 61, Mass. Check CP 4347 opp. last page.)

Gives heat exchanger data

Data on heat exchangers for plating, pickling, and anodizing solutions is given in four-page catalog. Included is formula for determining size of unit needed for any heating or cooling load.

Cat "CAMAC Heat Exchangers" is issued by Carl Buck & Associates, Dept. CP, Essex Fells, N.J. Check CP 4348.

Efficient/Practical SOLVENT EXTRACTION AT LOW COST



The York-Scheibel multi-stage extraction column is ideal for simple counter-current extraction; and for fractional liquid extraction in which the feed material is simultaneously contacted by two selective and immiscible solvents.

Check these features...

- POSITIVE MIXING
- POSITIVE PHASE SEPARATION
- SINGLE, COMPACT COLUMN
- HIGH THROUGHPUT CAPACITY
- HIGH EFFICIENCY
- LOW STAGE HEIGHT
- LOW COST PER STAGE.

YORK

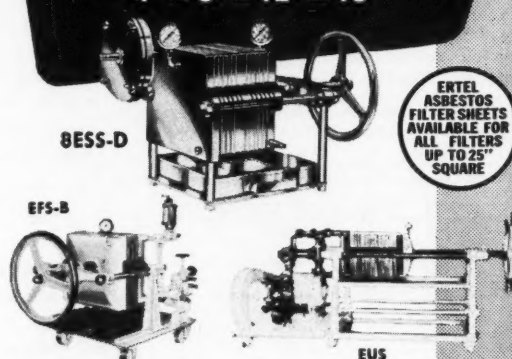
YORK PROCESS EQUIPMENT CORP.

4 Central Avenue
WEST ORANGE, N. J.

Complete illustrated catalog available describing laboratory, pilot plant and large scale extraction columns.

When inquiring check CP 4349 opposite last page

NOW AVAILABLE... COMPLETE RANGE OF STAINLESS STEEL PLATE & FRAME SHEET FILTERS 4" - 8" - 12" - 16"



ERTEL
ASBESTOS
FILTER SHEETS
AVAILABLE FOR
ALL FILTERS
UP TO 25"
SQUARE

Ideal for products ranging from ultra fine pyrogen solutions to coarse prefiltered bulk chemicals.

Send for Catalog illustrating the complete line of corrosion resistant filtration equipment.

ERTEL ENGINEERING CORPORATION

KINGSTON 3, NEW YORK
Branch Office & Showroom Located in New York City
COMPLETE LINE OF
Liquid Handling Equipment



When inquiring check CP 4350 opposite last page

CHEMICAL PROCESSING

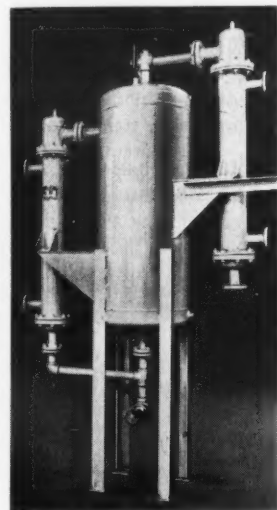
Still's standardized design assures ready availability, moderate cost . . .

simple-to-operate unit made in five sizes; capacities range from 80 to 300 gph

Uses: Reclaiming solvents.

Features: Design is based on standard stock parts, permitting ready availability, moderate cost, and quick delivery.

Description: Units are available in five standard sizes with capacities ranging from 80 to 300 gph. Floor space required for largest still is about 7'6"x4'0"x12" high. Standard construction is of carbon steel, but stainless alloy or other non-ferrous units are also available. Stills can be had for either batch or semi-continuous operation. Units are recent addition to manufacturer's regular line of equipment.



Largest still occupies 7'6"x4'0"x12'-high area

(Solvent reclaiming still is development of Process Equipment Department, Struthers Wells Corporation, Dept. CP, Warren, Pa. . . . or check CP 4351 opposite last page.)

Waste treatment equipment

Sewage and waste treatment equipment is discussed in 24-page catalog. Equipment includes bar screens, thickeners, classifiers, sludge removal units, and other equipment.

Bul G50 is issued by Walker Process Equipment Inc., Dept. CP, Aurora, Ill. Check CP 4352 opposite last page.

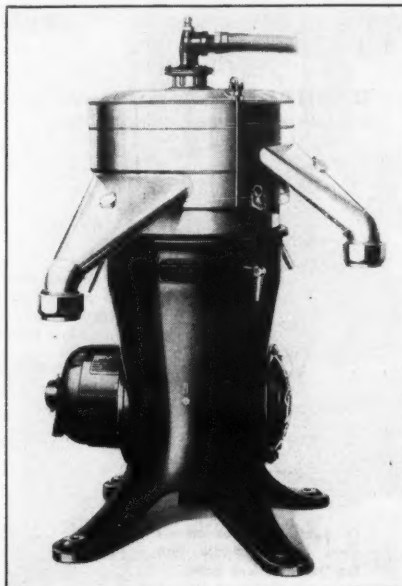
Reviews full line of pulverizers

Full line of impact-type pulverizers is described in four-page catalog. Units are available in five sizes ranging from $\frac{3}{4}$ to 75 hp. Literature also includes list of over 130 users of the equipment.

Cat 5510 is issued by Pulva Corp., Dept. CP, 550 High St., Perth Amboy, N.J. When inquiring specify CP 4353 on form opposite last page.

The Most Profitable Processing Is CONTINUOUS Processing...

by DE LAVAL!



If there are filters or settling tanks anywhere in your production line . . . you've got a wide-open chance to cut costs and improve the profit picture!

Because De Laval Centrifugal Separation or Clarification can break production bottlenecks . . . change stop-and-go processing to continuous operation . . . save time . . . labor . . . money!

De Laval can not only do the job faster but better!

Ask for all the facts . . . it will pay you in higher profits!



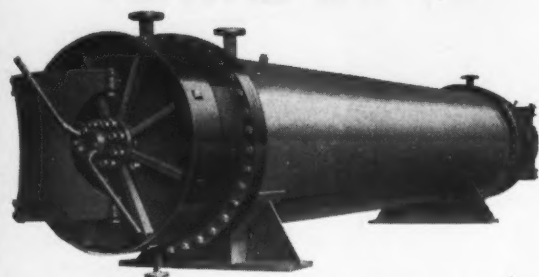
DE LAVAL
for faster processing systems

THE DE LAVAL SEPARATOR COMPANY Poughkeepsie, New York • 427 Randolph St., Chicago 6 • DE LAVAL PACIFIC CO. 201 E. Millbrae Ave., Millbrae, Calif.

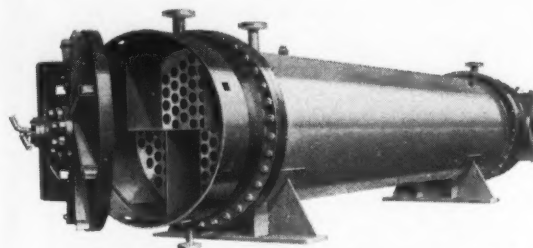
When inquiring check CP 4354 opposite last page

Heat Exchangers Open in 5 Seconds with new **p-k** Lever-Lock Door^{*}

Substantial savings seen for processors of high-fouling liquids
and others who must clean and inspect heat exchangers regularly.



CLOSED, the Lever-Lock looks like this. A single 1/6th turn of the lever draws back the lock bars.



OPENED manually with an easy pull, the tubes and tube sheet are easily accessible.

Anyone who has had to open a heat exchanger knows how time-consuming and costly it can be. Dozens of bolts must be loosened. Specialized labor is often required. Now these problems can be things of the past. **p-k**'s Lever-Lock Door, available on **p-k** heat exchangers, provides five-second access to the unit—and a new approach to exchanger design. The door "unlocks" with a 60° manual turn of a lever. In horizontal position the door then swings open easily. In vertical position, it is lifted by means of a pneumatic cylinder. Either way, it seats itself automatically on a long-life, self-sealing gasket. Other features allow Lever-Lock to be used in a wide range of applications:

- Available in all alloys
- Pressure range from full vacuum to 300 psi
- Temperatures to 400°F. (Special alloys for sub-zero applications)
- Mechanical lock available to prevent opening vessel when pressurized
- No maintenance other than simple lubrication
- Available in diameters from 16" through 36"

Lever-Lock doors have been used successfully not only on **p-k** heat exchangers, but on **p-k** autoclaves and sterilizers in the chemical, textile, food processing, and rubber manufacturing industries as well. For all of them, and wherever exchangers carry high-fouling liquids or require frequent entry for cleaning and inspection, Lever-Lock doors pay for themselves through savings in time. Heat transfer can be more efficient, too, since you can afford to remove gunk more frequently.

But this is only part of the story. If you see the Lever-Lock as the answer to a perplexing problem in your plant, why not write for all the facts, today?

The Patterson-Kelley Co., Inc., 730 Lackawanna Avenue, East Stroudsburg, Pa., and principal cities

^{*}Pat. Pending

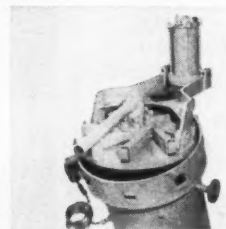
PATTERSON-KELLEY



1. This autoclave is in vertical position with its Lever-Lock Door equipped with a pneumatic cylinder.



2. To open, operator merely gives lever a 1/6th turn that releases lock bars.



3. Door is lifted in 5 seconds—automatically! An hour or more of work is saved.

Write for new **p-k** Bulletin No. 2030 for full details.



PROCESSING EQUIPMENT

Fully-automatic control featured on batch centrifugals . . .

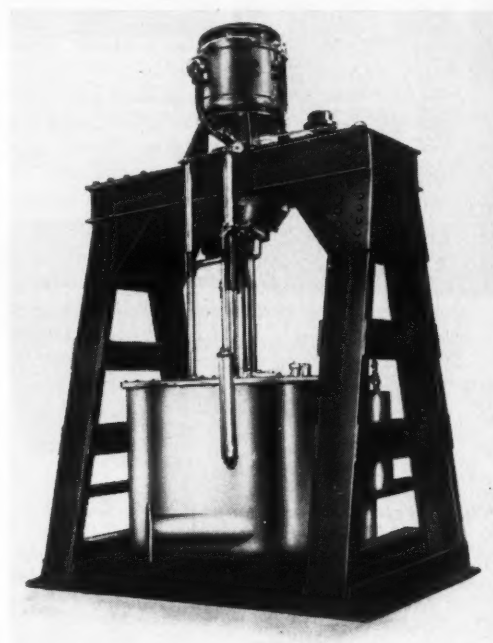
entire operating sequence controlled by master timer, motor starter, electrically-operated valves

Uses: Liquid-solids separation.

Features: Units operate entirely automatically, including loading, spinning, washing, and unloading.

Description: Operating sequence is controlled by master timer used in conjunction with a two-speed magnetic motor starter, and electrically-operated air and water valves. Motor starts at low speed at beginning of cycle and rapidly accelerates to the loading speed.

Charge valve opens automatically. In cases where solids concentration is uniform, the valve is also closed on the time cycle. In applications where solids concentration is irregular, valve is closed by



Loading, spinning, washing, and unloading are performed automatically on batch centrifugal

a cake thickness detector, which actuates valve after a predetermined thickness is built up in basket. Washing and spinning times are controlled by the master timer.

Air brake brings basket automatically down to 50 rpm unloading speed. At this point, an electrically-controlled unloader discharges the cake. In applications requiring a basket valve, an air-operated cone valve can be installed which automatically plows out the cake. Auxiliary timers may be attached for phases of the operation which require frequent changes.

PROCESSING EQUIPMENT

Unit can be set to recycle automatically or come to a complete halt after each cycle. If charging, washing, and spinning times are impractical for automatic operation, then only the unloading phase can be made automatic.

Equipment also includes an automatic unbalanced knock-off switch, which protects against excessive basket oscillations. Device shuts off motor and applies brake in event of a badly unbalanced load.

(Automatic batch centrifugals are product of Fletcher Works, Inc., Dept. CP, Glenwood Ave. & Second St., Philadelphia 40, Pa. . . . or for more information check CP 4356 opposite last page.)

Multi-color diagram highlights chlorinator catalog

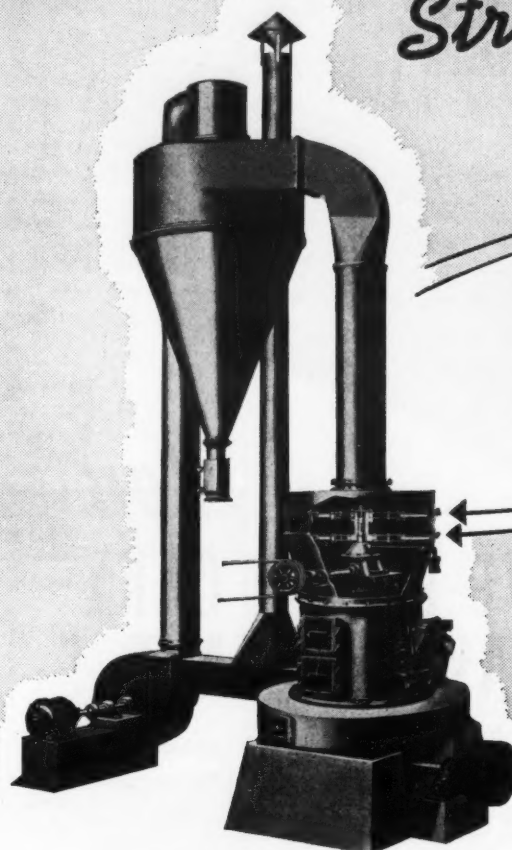
Chlorinator for purifying water supplies, treating sewage and industrial wastes, and for control of slime, is described in 16-page catalog. Highlight of literature is two-page multi-color flow diagram which illustrates unit's operation.

Cat 70-10 is issued by Fischer & Porter Co., Dept. CP, 539 Jacksonville Rd., Hatboro, Pa. Specify CP 4357 on form opposite last page.



"Jones, you've been working too hard. Take a vacation."

Why don't you earn a few bucks extra for your vacation? Ken Quetchenbach of Eastman Kodak (Rochester) received \$10 for this cartoon. You can earn some cash, too. See announcement on page 23.



*Streamline your
Production!*

RAYMOND DOUBLE WHIZZER ROLLER MILL

Close fineness control
Clean dustless operation
Rapid moisture removal
Pneumatic feed control
Air cooling and conveying

THIS compact mill system combines in *one* simultaneous process the functions of several different units. The result is a streamlined operation that saves floor space, simplifies plant layout, avoids re-handling materials and speeds up production.

In making fine chemicals, pigments, non-metallic minerals, fillers and many special materials, the Raymond Whizzer-type Roller Mill gives close control of the finished product in fineness, dryness and

uniformity. When the mill is equipped with Flash Drying accessories, a definite percentage of surface moisture may be removed while pulverizing.

You will find that Raymond Roller Mill economy is an important factor in your production. Ease of installation, low cost operation and maintenance, as well as pneumatic feed control which keeps a maximum "load" on the mill at all times, all add up to substantial savings that reduce your overall costs.



For further details, write
for Raymond Catalog No. 79



COMBUSTION ENGINEERING, INC.
Raymond Division
1317 NORTH BRANCH ST.
CHICAGO 22, ILLINOIS

Combustion Engineering-Superheater Ltd., Montreal, Canada

SALES OFFICES IN
PRINCIPAL CITIES

When inquiring check CP 4358 opposite last page

with **VISKON**[®] filter fabric



HERE'S WHY

VISKON filter fibers are encased in a special bond which creates a smooth surface. This smooth surface prevents filter aids and refuse in slurry from becoming enmeshed in the fibers. That is why it is so easy to remove filter cake. In fact, filter cake actually slides off VISKON—takes only seconds to clean by merely scraping or low pressure hosing! Downtime is reduced to a minimum . . . filter cycles are frequently increased by 35% due to longer continuous line flow. This, plus clearer filtrate and amazing wet strength, makes VISKON Filter Fabric an amazing new filter medium.

Have YOU Checked VISKON[®] non-woven filter fabric?
You can Cut Downtime to Minimum, Save on Unit Cost.

MAIL THIS COUPON NOW OR

Dictate Your Inquiry Letter To:

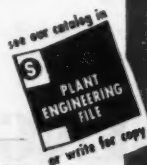
Mr. A. I. Pierce, Filter Media Engineer
THE VISKING CORPORATION Dept. CP-3
P. O. Box 72 • North Little Rock, Arkansas •

NAME _____

ADDRESS _____

CITY _____ ZONE _____ STATE _____

Type of Filter Press _____



VISKON[®]
nonwoven fabrics

When inquiring check CP 4359 opposite last page

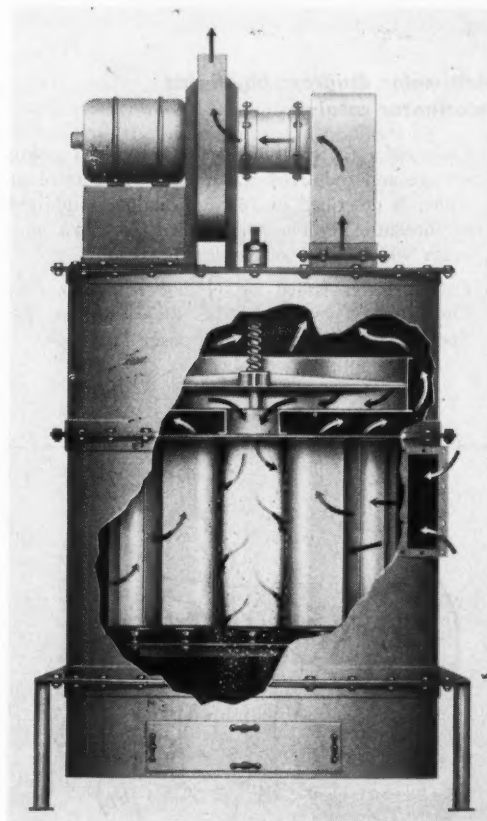
PROCESSING EQUIPMENT

**Compact, continuous dust collector
uses reverse-jet air cleaning,
is 99.9% efficient . . .**

can be equipped with casters, moved to places where temporary dust problems exist

Uses: Designed to remove dust from relatively small volumes of air.

Features: Unit lends itself to all continuous process equipment because no shutdown is needed for rapping or cleaning. High-velocity reverse-jet air cleaning assures peak performance with 99.9 per



Interior design and operation of dust collector. Dust-laden air enters at right, clean air is exhausted at top

cent collection efficiency. Unit can be mounted on casters, enabling shifting to places wherever temporary dust problems exist.

Description: Dust-laden air passes through filter sleeve chamber where dust is collected on outside of felt filter media. There are 12 filter sleeves in the chamber. Collected dust is automatically removed from sleeves by surge of high-pressure reverse-jet air from rotating indexing drum located at top of unit. Dust drops into clean-out chamber at bottom of unit. Collector may be equipped with hopper and rotary valve for continuous discharge of dust.

PROCESSING EQUIPMENT

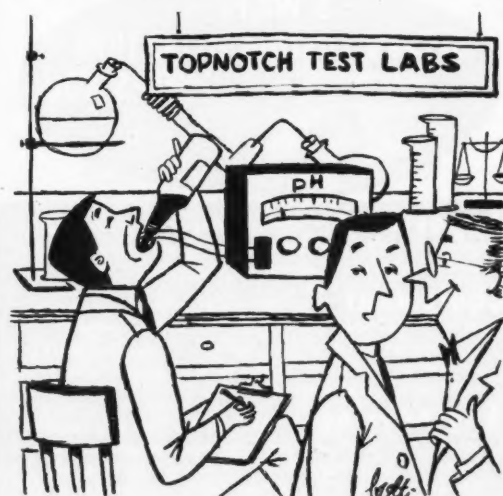
Unit is shipped assembled; the only installation required is piping and electrical connections. Collector is 4'2" in diameter and 8'3" high. All moving parts are located on clean-air side of filter media in easily accessible chamber. Unit's effective filtering area is 58.5 sq ft.

(Type RJ dust filter is product of The Day Company, Dept. CP, 810 Third Avenue, N. E., Minneapolis 13, Minn. . . or for more information check CP 4360 on form opposite last page.)

Deals with applications, design of fluid coolers

Illustrated eight-page bulletin gives complete information on the construction, performance, and maintenance of dry-type fluid coolers. Photographs and descriptions of units in actual operation are included. Coolers use air as cooling medium and are especially useful in areas where water is scarce.

Bul S-395 may be obtained on letterhead request from The Trane Company, Dept. CP, La Crosse, Wisconsin.



"Jones doesn't lose any time running those beer samples!"

Idea for this cartoon was sent to us by Roland Gunther, who works with Dehls & Stein Inc., Newark, New Jersey.

Mr. Reader, your cartoons and cartoon ideas can be worth money! We'd like to see them. Turn to page 23 for the details.

MANY MODELS TO CHOOSE FROM —special engineering adaptations if necessary



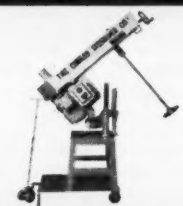
10-20V with hydraulic lift. For big-volume production. Height, max. lift, 122". 10-30 HP.



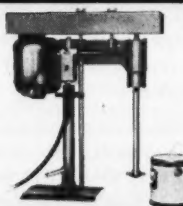
10-20B, for installation on your own tanks. For adaptation up to 40 HP.



200—Tank Type. Standard models for capacities of 100, 250 and 500 gallons. Special engineering for specific needs.



7-VTV—Mobile Tip-Up Type. For 5 to 80 gallon batches. Width 4 1/4". Max. tilt will accommodate 46" tank.



1-VT Laboratory Tip-Up Type. For testing, pilot plants and small batches. Results identical to production-size models. Max. rise, 44".

NEW improved models of COWLES DISSOLVERS

give you ultimate dispersion

2 to 20 times faster than ordinary

machines—in a fraction of the

space—at a fraction of the cost

*Let us prove it in your
plant...at our risk!*

Here are typical examples from the complete new line of Cowles Dissolvers. They feature many improvements that make them better than ever before. If you are using bulky, slow, conventional equipment, the proper Cowles equipment for your needs will give you increased speed, greater volume and higher quality end products—plus savings in cost—that will amaze you.

We are so sure of its many advantages we want to demonstrate them to you—with the actual equipment, in your own plant, on your own products—without obligation to purchase.

Applicable to viscosities up to and in excess of 50,000 centipoises, they impart high velocity to material at a speed of 3600 to 6000 f.p.m. at the periphery of the impeller. Zones of intense turbulence are created, producing extreme shear and impact. After turbulence, flow becomes laminar, dividing at vessel wall to assure complete circulation of the entire batch. This action breaks down solids to ultimate dry particle size, exposes greatest possible area of reactants to each other, and surrounds each particle with a film of liquid.

The new models require less head room, include patented impellers for processing a wide variety of products, and many other refinements for ease of operation and maintenance. If milling is required following mixing, teaming up Cowles Dissolvers with Morehouse Mills will produce products of finest quality at rates that are nothing less than spectacular.

A trial will convince you that this equipment will give you greater production, of higher quality, at less cost—all over results that mean you can—

Make More Profits with Morehouse-Cowles

You can make such a trial in your plant at our risk. Write today for complete details—

MOREHOUSE-COWLES, INC., 1150 San Fernando Rd., Los Angeles 65, Calif.
Representatives in Principal Cities (Cable Address "MORESPEED," Los Angeles)

Quality Production Champions
of the Processing Industries.

Convenient lease and
time-payment plans.



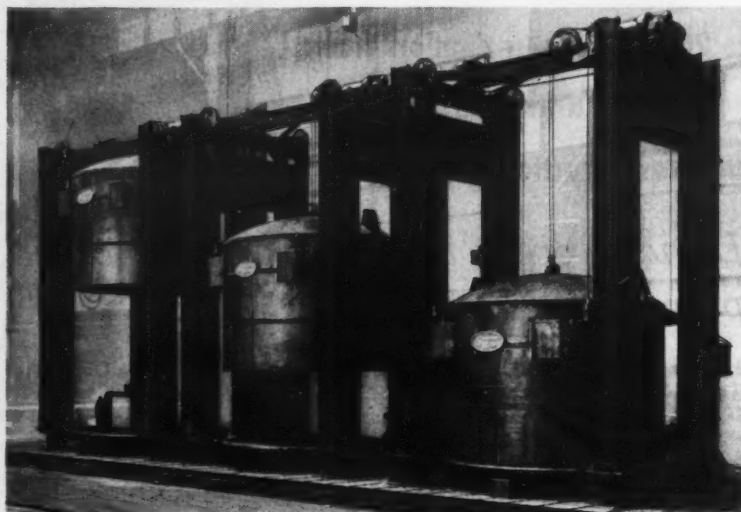
9602

When inquiring check CP 4362 opposite last page

Designed, engineered and built by Struthers Wells ...

SPECIAL PROCESSING EQUIPMENT

meets all code specifications and your exact requirements



STRUTHERS WELLS PRODUCTS

BOILER DIVISION—BOILERS for Power and Heat ... High and Low Pressure ... Water Tube ... Fire Tube ... Package Units

PROCESSING EQUIPMENT DIVISION—Crystallizers ... Direct Fired Heaters ... Evaporators ... Heat Exchangers ... Mixing and Blending Units ... Quick Opening Doors ... Special Carbon and Alloy Processing Vessels ... Synthesis Converters

FORGE DIVISION—Crank-shafts ... Pressure Vessels ... Hydraulic Cylinders ... Shafting ... Straightening and Back-up Rolls

MACHINERY DIVISION—MACHINERY for Sheet and Structural Metal Forming ... Tangent Benders ... Folding Machines ... Roller Table and Tumble Die Bending Machines ... Press Brakes ... Punching and Notching Machines ... Forming Dies

STRUTHERS WELLS CORP.

Struthers Wells

TITUSVILLE, PA.

PLANTS AT TITUSVILLE, PA.
AND WARREN, PA.

Offices in Principal Cities

PROCESSING

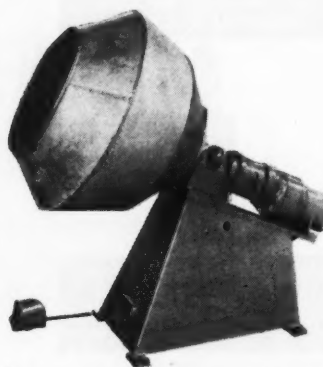
Fluid drive on tablet coater gives smoother operation, better results ...

eliminates shock loads which cause non-uniform coatings

Uses: Coating or polishing pharmaceutical tablets.

Features: Fluid drive in power unit permits pan to be brought up to speed and stopped smoothly, avoiding shock loads which cause non-uniform coatings or cracking of tablets. Elimination of shock loads also assures longer gear life for this unit.

Description: Improved-design tablet coating and polishing machine has integral, totally-enclosed drive that includes a 1-hp motor,



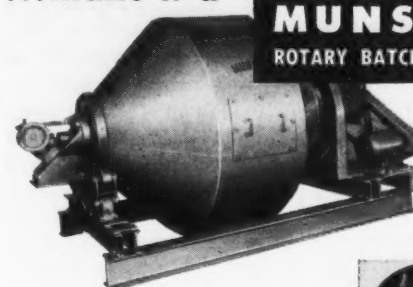
Tablet coating and polishing stand occupies 5 1/2 x 4 ft floor space and is 5 1/2 ft high

fluid coupling, and geared speed reducer. Pan drive shaft is supported by two double-row pillow block bearings.

Unit occupies 5 1/2 x 4 ft floor space and is 5 1/2 ft high. Galvanized, stainless steel, or copper pans (up to 48" diam) are available for coating operations. Pans with canvas linings can be had for polishing work.

(No. 16 tablet coating and polishing stand is product of Arthur Colton Company, Dept. CP, 3400 East Lafayette Avenue, Detroit 7, Michigan ... or for more information reader may simply check CP 4364 on the convenient Reader Service slip which is located opposite last page.)

For faster, more accurate blending of dry ingredients ... make it a



MUNSON
ROTARY BATCH MIXER

Unequalled for dry mixing of chemicals, insecticides, powdered metals, fibrous materials, fertilizers, gelatin, glue, soap compounds, etc. Available in capacities from 20 to 250 cu. ft. Provides faster, more accurate blending, yet will not grind or reduce size of particles. Can be fitted with internal spray for introduction of limited amount of liquid.

Write for Details

MUNSON MILL MACHINERY CO.

Dept. P-356, Utica, New York

When inquiring check CP 4365 opposite last page



EXCLUSIVE
MULTIPLE-BLENDING
ACTION

Lifters cut out and lift ingredients. Rotating cone tumbles stock. Empties completely after every mix.

3 WAYS
SPERRY CUSTOM FILTRATION
... HELPS YOU!

Experience—SPERRY OFFERS YOU the knowledge gained thru 88 years designing and constructing thousands of filter presses for hundreds of industries.

Equipment—SPERRY OFFERS YOU a complete selection of the finest filter presses, standard or special all types and sizes of filter media ... plus the widest selection of closing devices and other time-savers—for all types of industrial filtration.

Engineering—SPERRY OFFERS YOU free consultation. Our laboratory and engineering departments are always at your disposal for information regarding your filtration problems without cost or obligation.

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BATAVIA, ILLINOIS

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Denver 18, Colo.
Texas Chemical Engr. Co. 4101 San Jacinto
Houston 4, Texas



When inquiring check CP 4366 opposite last page

CHEMICAL PROCESSING

When inquiring check CP 4363 opposite last page

High capacity, low operating cost features of continuous high-vacuum still

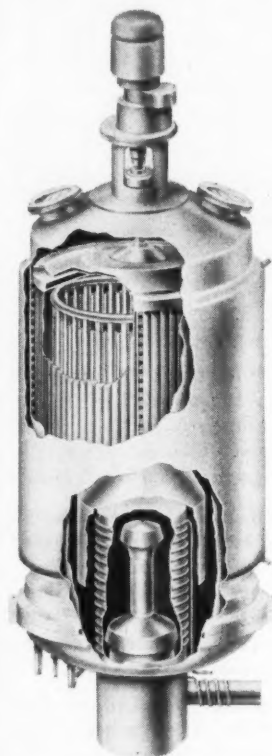
Uses: High-vacuum and molecular distillations.

Features: Stills can be operated continuously, have large capacity, and are simple and economical to run. Equipment permits low-cost commercial distillation of high-molecular-weight (between 200 and 1200) materials. Heat-sensitive materials with molecular weights below 200 may also be processed using refrigeration on condenser.

Description: Stills are of the falling-film type, capable of being operated under controlled and

variable conditions. Vacuum is attained by means of an oil-diffusion pump built into still housing. Uniform, non-turbulent, thin film layer is maintained on evaporation surface by means of a slow-speed "Rota-Wiping" mechanism. Latter consists of motor-driven rotor assembly equipped with vertical wiper arms. Wipers are made from carbon of a hardness equal to stainless steel.

Feed is accomplished by means of an oil-sealed positive-pressure gear pump through a rotameter and feed control valve. Heating is generally done with Dowtherm in still's pressurized jacket (75 psi max). Vertical-tube condenser is centrally located inside still opposite evaporation surface (see drawing). Standard condenser



Cut-away shows interior of high-vacuum still. Built-in oil-diffusion pump can be seen at bottom. Rotor assembly and vertical-tube condenser are shown on top

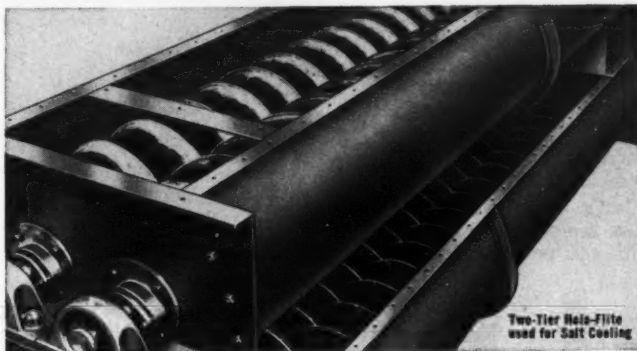
construction is of aluminum, but other materials of construction are available. Condenser may be water-cooled or refrigerated with circulating cooling fluid. Distillate is discharged via rotameter through an oil-sealed gear pump (nitralloy). Stills are available with 12, 36, 48, 60, and 90" evaporator diameter.

(Rota-Film stills are product of Arthur F. Smith Company, Dept. CP, Rochester 3, New York . . . or check CP 4367 on form opposite last page.)

A revolutionary new principle in Coolers . . .

THE holo-flite^{*} PROCESSOR (HOLLOW-FLITE)

Backed by the same well-known organization that pioneered COTTRELL Precipitators, MULTICLONE Collectors and other leading products, the HOLO-FLITE Processor represents a far-reaching advancement in the science of heat-exchanger design. Widely adaptable to various types of cooling and similar applications in industrial processing operations, the HOLO-FLITE handles powdered or granular solids, moist pastes or slurries with equal facility. Moreover, it requires as little as 1/5th the space of other heat exchangers . . . causes no dust, therefore requires no costly or complicated auxiliary recovery equipment . . . and maintains its uniformly high efficiency under modern continuous-flow operations (no stop-and-go "batching" operations are necessary).



Unique Simplicity

Basically, the HOLO-FLITE consists of two or more hollow intermeshing conveyor screws that slowly rotate in a trough or tube. The cooling agent circulates through the hollow flights and shafts of the conveyor screws while the product itself "flows" in the trough where it is constantly rotated into, around, over and under the moving heat-exchange surfaces. The continuous mixing, turning, folding action causes a constant change of contact with the heat-exchange surfaces and results in a high rate of heat transfer. Yet the action is so gentle that there is no dusting and little, if any, abrasion of crystalline particles.

Unlimited Capacity

HOLO-FLITE Processors can be readily adapted to virtually any capacity requirement and are in daily operation on such varied products as sand, cement, cottonseed cake, soybean meal, borax, salt, sugar, baby foods, and many other products. Cooled products can be packaged directly from the HOLO-FLITE discharge, saving time, space and additional handling.

Be sure to investigate HOLO-FLITE savings before you install heat-exchange equipment. To insure maximum operating efficiency at low overall cost, each installation is individually engineered to the job using basic stock-size elements. Contact the nearest Western Precipitation office for further details on the revolutionary HOLO-FLITE Processor—or write direct!



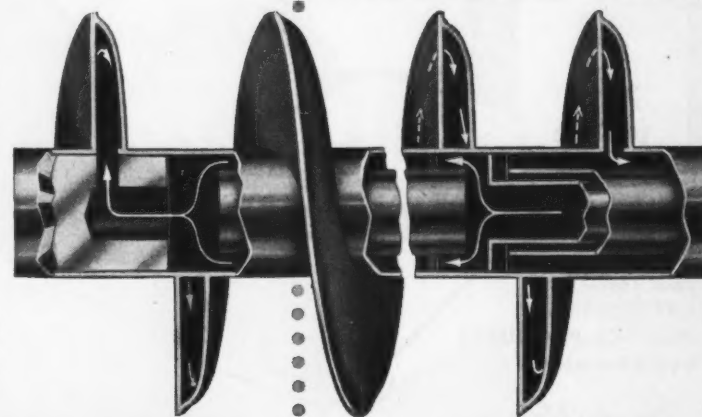
FREE! New 8 Page Bulletin describing HOLO-FLITE features and applications will gladly be sent on request!

*Reg. T.M.

► Handles Pastes, Sludges or Solids!

► Up to 80% Saving in Space!

► Permits Continuous, High Efficiency Operation!



A FEW OF MANY HOLO-FLITE ADVANTAGES

WIDE ADAPTABILITY: HOLO-FLITE handles fine-grained, crystalline or powdered solids, pulps, pastes and slurries with equal ease. Heat transfer agent can be refrigerant, cooled or ambient water, or other fluids to provide a wide range of processing temperatures.

SPACE-SAVING COMPACTNESS: Because of its large active heat-transfer surface per cubic foot of space required, the HOLO-FLITE requires only a minimum of space—is 5 to 6 times as compact as other equipment of comparable capacity!

LOW POWER REQUIREMENTS: HOLO-FLITE conveyor screws rotate slowly—usually only 1 to 12 r.p.m. Further, multiple tiers can be driven by one motor, assuring low power consumption.

INSTALLATION FLEXIBILITY: The basic HOLO-FLITE unit is two intermeshing screws in a single trough, but four or six screws per trough can also be installed. Moreover, any number of troughs can be "tiered" on top of one another—trough lengths can be varied from 8 to 20 ft.—screw diameters can be varied from 7" to 16"—to provide virtually any desired capacity in a minimum of space!

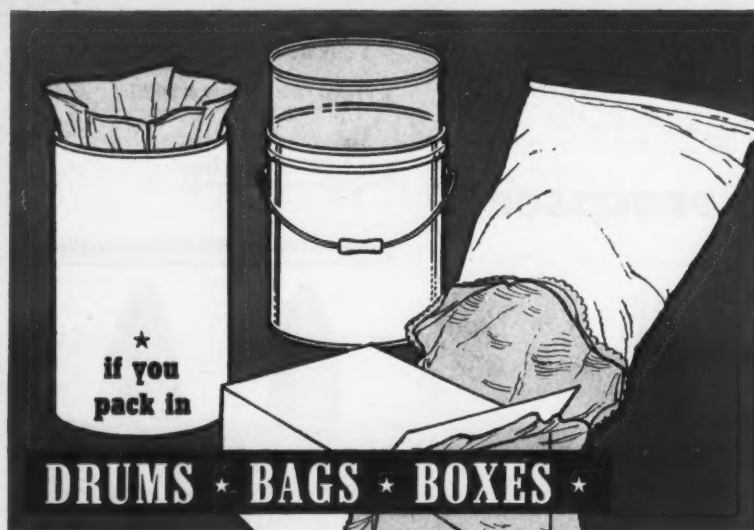
Write for full details on the many savings the HOLO-FLITE Processor can bring to your particular applications.

WESTERN Precipitation CORPORATION

DESIGNERS AND MANUFACTURERS OF EQUIPMENT FOR COLLECTION OF SUSPENDED MATERIALS FROM GASES & LIQUIDS

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When inquiring check CP 4368 opposite last page



you can
CUT COSTS—
PROTECT PRODUCTS
BETTER—with

Durethene POLYETHYLENE FILM LINERS

It's amazing how you can cut into packaging costs when you use Polyethylene Film to line your drums, bags or boxes. In shipping weights alone, savings can be hefty. Then, you're setting up a big barrier against spoilage and waste—because Polyethylene keeps contents in, no matter how active or volatile . . . bars intruding contamination out . . . is inert to almost all widely used chemicals, so there's no container-product reaction to fear.

The kind of Film is important, of course. That's the reason so many well-known products travel in containers lined with DURETHENE Polyethylene Film—the strongest Film you can get. And DURETHENE specializes in helping packagers solve hard problems; call us in to check on what can be done to give you greater protection and reduced packaging and shipping costs. Right now, send for our useful "Application Bulletin", covering Polyethylene use with hundreds of chemicals. And when you buy liners, ask your converter for DURETHENE . . .

**THE POLYETHYLENE FILM
WITH THE "DOUBLE-PLUS" QUALITY**



Durethene CORPORATION
Manufacturers of Polyethylene Film for Converters
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1401 W. ARBOR VITAE ST. . . LOS ANGELES 45, CALIF.
Phone: TR 4-1111, 173 NORTH AVENUE, NEW YORK, CITY 10

Please send free copy of your **POLYETHYLENE APPLICATION GUIDE**, and samples made from DURETHENE Film. We are now packaging in Polyethylene:

_____ We plan to package in Polyethylene:
CP

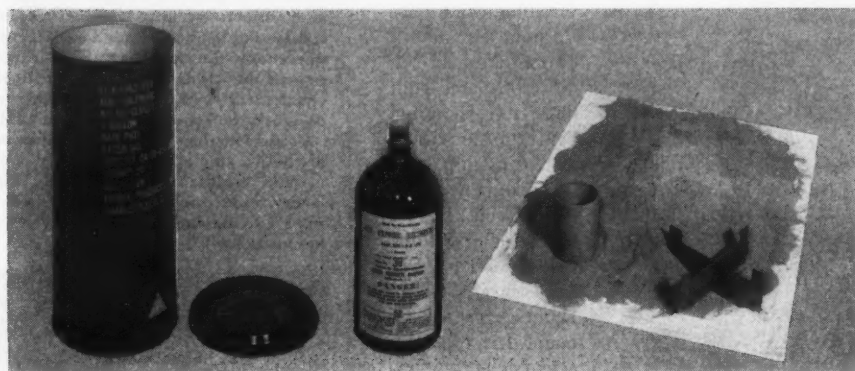
Signed _____
Company _____
St. & No. _____ City _____ State _____

When inquiring check CP 4369 opposite last page

packaging

Both safety and convenience are built into acid shipping container which . . .

protects acid bottle through sixteen drop tests



Outer container, bottle, top and bottom spacer, and filler material for acid shipper are shown from left to right

As a user of gallon bottles of sulfuric acid, the US Army has set up stiff specifications on shipping containers for these. In 1953 the Army issued specifications for three types. There were drawbacks for producer or user in each of these. Now a container has been developed which seems to overcome difficulties of making and using safe shipping packages.

Designed for Army Ordnance, this pack is of spirally wound chipboard laminate sealed with asphaltum in the final lamination. Sheet metal outer container is fitted with prestamped lids which fit together for secure stacking. This is accomplished by forcing an addition ridge in the top as container is seamed. Other components of the final package are a brace or bottom spacer to hold bottle in place in the container, an absorbent filler material, and, of course, the gallon bottle itself.

By attaining a production of 600 acid packs an hour (versus 200 for the old style) the Army estimates that it can save about thirty cents per gallon unit. Lighter weight of the container is an advantage to the Army in shipping and carrying.

In tests at the Rossford Ordnance Depot in Toledo, Ohio, such a container with a gallon bottle of acid was dropped from a height of thirty inches sixteen times without breaking the bottle. On the sixteenth drop the container was damaged. Bottle was never broken.

Container has also been tested by the Bureau of Explosives. As a result of these tests ICC has accepted the container for shipment through regular commercial channels without special permit.

One safety feature which is built into the container is a filler material — asbestos or vermiculite — which absorbs acid should the bottle be broken. Bottle is braced at bottom by a fiberboard cross-piece. Top of bottle is held in place by a cylindrical top spacer.

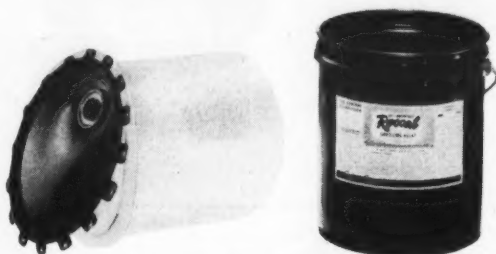
(These acid shipping containers are available through Commercial Packaging Dept., United Can Div., American Seal-Kap Corp., Dept. CP, P.O. Box 42, Phillipsburg, N.J. . . . or for more information check CP 4370 on form opposite last page.)

**Drum liner, of polyethylene,
is hermetically sealed . . .**

plastic, with no known solvent, is not affected by most chemicals

Uses: For handling and shipping of such materials as dry hygroscopics, cyanide concentrates, silver nitrate, wetting agents, and acid or alkali-reacting adhesives.

Features: Liners, of polyethylene, are constructed of 0.006 film. Inert plastic is unaffected by most chemicals and has no known solvent.



Liner top locks into brim when metal lid is attached, preventing slipping and friction which would cause failure

Description: Liner is form-fitting — eliminating pleats and folds which fracture from shipping vibrations. Flare top locks into brim when metal top is attached, preventing slipping and friction against the can which would cause failure. Liner, within the drum, is hermetically sealed.

(Jasperdrum, with polyethylene liner of Visqueen film, is product of Jasper Bag Co., Dept. CP, 1220 W. Sixth St., Cleveland, Ohio . . . or for more information check CP 4371 opposite last page.)

**Resists hot, dry weather,
meets ICC Specs . . .**

CAUTION label needs no moistening, grips any clean, smooth surface

Uses: For labeling of highly volatile liquids, those with a low ignition point or other materials where label durability must meet Govt. specs.

Features: Pressure-sensitive adhesive will not deteriorate under adverse temperature or humidity conditions.

Description: Labels meet requirements of Interstate Commerce Commission. No moistening is required and labels will not peel, curl or pop off.

(Pressure-sensitive "Caution" label is product of Avery Adhesive Label Corp., Dept. CP, 1616 S. California St., Monrovia, Calif. . . . or for more information check CP 4372 opposite last page.)

BAGPAK

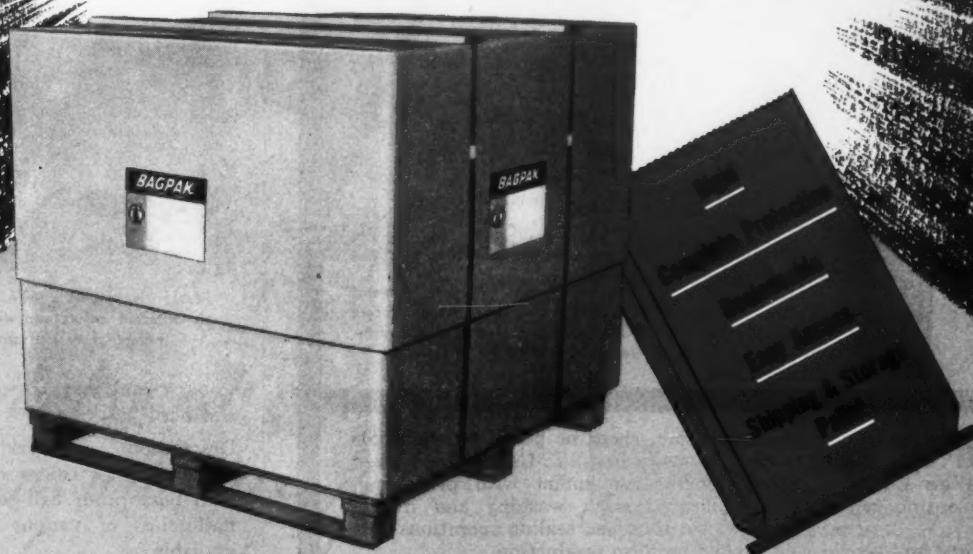
leads the field *again*

with the **NEW**

BAGPAK PALLET

(Trademark)

FOR MULTIWALL BAG SHIPMENTS



After months of development and severe shipping tests International Paper Company offers a new service—the sensational, new **BAGPAK PALLET**, which gives you these advantages:—

- **NO chafed or damaged bags**
- **Bags arrive Factory-Fresh—NO distortion**
- **Neater storage—safer, higher stacking**
- **Complete protection for your bags from dust or contamination**
- **Savings in handling and storage**
- **Replaceable cover feature—protects unused bags**

→ **The new BAGPAK PALLET at no extra charge***

(Note* Shipping wts. 1500-1800 lbs.)

Let BAGPAK ship you a car of multiwalls in these new money saving **BAGPAK PALLETS**.

For details write to Dept. CP-3

International Paper COMPANY
BAGPAK DIVISION
220 EAST 42ND STREET, NEW YORK 17, N. Y.

BRANCH OFFICES: Atlanta • Baltimore • Boston • Chicago • Cincinnati • Cleveland • Dallas • Denver • Des Moines • Detroit • Kansas City • Kansas • Los Angeles • Minneapolis • New Orleans • Philadelphia • St. Louis • San Francisco • IN CANADA: The Continental Paper Products, Ltd., Montreal, Ottawa, Toronto

When inquiring check CP 4373 opposite last page

Cambridge

WOVEN WIRE CONVEYOR BELTS

take the bottlenecks out of
WASHING, DRYING, PACKAGING



OPEN MESH of rustproof, all-metal belt provides free circulation of process solutions and drying air; assures waste-free packaging.

Whether you're processing slab, sheet or pelletized materials . . . or packaging bottles, drums or bags . . . Cambridge Woven Wire Conveyor Belts combine movement with processing. Continuous belt-to-belt flow through washing and drying cycles, roasting kilns, and weighing and sealing operations cuts cost and provides controlled uniform production.

Open mesh allows heat and gases to circulate freely all around your material and provides rapid drainage of process solutions. Spilled materials fall through and are easily salvaged. All-metal belt is corrosion resistant and impervious to heat damage at temperatures up to 2100°F. Cambridge belts have no seams, lacers or fasteners to wear more rapidly than the body of the belt . . . no localized weakening.

Cambridge Woven Wire Belts for the Process Industries are made in any size, mesh or weave, and from any metal or alloy. Special retaining edges or cross-mounted flights are available to hold your product during inclined movement.

Call in your Cambridge FIELD ENGINEER to discuss how you can cut processing and handling costs. Look under "BELTING, MECHANICAL" in your classified phone book. OR, write for your copy of FREE 130-PAGE REFERENCE MANUAL giving mesh specifications, design information and metallurgical data.



The Cambridge Wire Cloth Company

WIRE CLOTH METAL CONVEYOR BELTS SPECIAL METAL FABRICATIONS

Department F
Cambridge 3,
Maryland



OFFICES IN PRINCIPAL INDUSTRIAL CITIES

When inquiring check CP 4374 opposite last page

PACKAGING

Marks on glass, metal permanently . . .

ink, of six different colors, is applied with ball-point tube

Uses: Fast-drying marking ink is useful for permanent marking on metal, plastics, wood or glass.

Features: Ink will not readily chip, peel or be affected by heat or weathering. Tests have shown that marks on metal have with-



Marker is available with inks of six different colors and with ball-points of various sizes

stood several years of weathering and hard usage.

Description: Marking ink, available in six colors, is applied with burst-proof ball-point tube. Ball-points of various sizes are available.

(Marker is product of John P. Nissen Jr. Co., Dept. CP, Glen-side, Pa. . . . or for more information check CP 4375 on form opposite last page.)

Tells how packaging was made easy

Packaging ideas contained in recent issue of steel strapping publication includes handling for rolls or aluminum foil, large packages for fragile gear.

Autumn 1955 issue of "The Signode Seal" is issued by Signode Steel Strapping Co., Dept. CP, 2630 N. Western Ave., Chicago 47, Ill. Specify CP 4376 opposite last page.



Service means...

completeness of the line

Vulcan makes top quality steel open head pails, closed head drums. Sizes; 1, 1½, 2, 2½, 3, 3½, 4, 5, 6, 6½, 10, 12 gallons with all types nozzles and pouring spouts. Complete lithography facilities available. Wide color selection for plain containers.



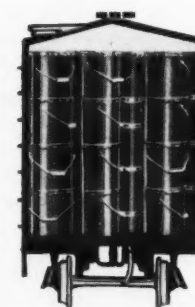
packaging research

Vulcan's modern research facilities are constantly at work developing and improving protective interior linings for all types of products... It's your answer to positive protection whether product is used immediately or stored indefinitely.



ready availability

Vulcan's constant inventory of all Standard pails speeds your order. Modern railroad and truck docks mean quick loading, immediate dispatch. From carton to carload or truckload —when delivery is important—call VULCAN!



OVER 40 YEARS CONTAINER EXPERIENCE

VULCAN CONTAINERS INC.

Bellwood, Illinois (Chicago Suburb) Phone: Linden 4-5000
In Toronto, Canada—Vulcan Containers Limited.
Representatives in all Principal Cities

When inquiring check CP 4377 opposite last page

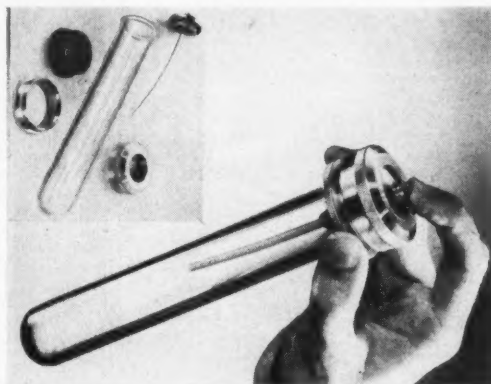
CHEMICAL PROCESSING

Tester affords visual check of aerosol compatibility

Pyrex-brand container may be used in laboratory or on regular production line

Uses: Unit makes it possible to tell visually whether interaction has taken place between propellant and contents of aerosol bomb. This affords quick test of purity of each batch of propellant.

Features: Bottles are same size and shape as standard aerosol can and can be run through production line for standard load. Pyrex-brand unit is available as a three-oz tube, six- or 12-oz bottle.



Tester is used with standard aerosol valve or, with special adaptor, with $\frac{1}{8}$ " Hoke needle valve

Description: Tester consists of glass tube or bottle with top assembly made of a flange holding a threaded metal coupling and O-ring. Coupling is screwed down over standard aerosol valve or, with a special metal adaptor, may be used with a standard $\frac{1}{8}$ " Hoke needle valve. Coupling parts are interchangeable and same coupling assembly may be used for any of three container sizes.

Besides compatibility, tester may be used for checks on spray and pressure characteristics. With usual precautions, unit may be used over entire pressure range common to aerosol packaging.

(Unit is by Fischer & Porter Co., Dept. CP, 48 Jacksonville Rd., Hatboro, Pa. Check CP 4378 opposite last page.)

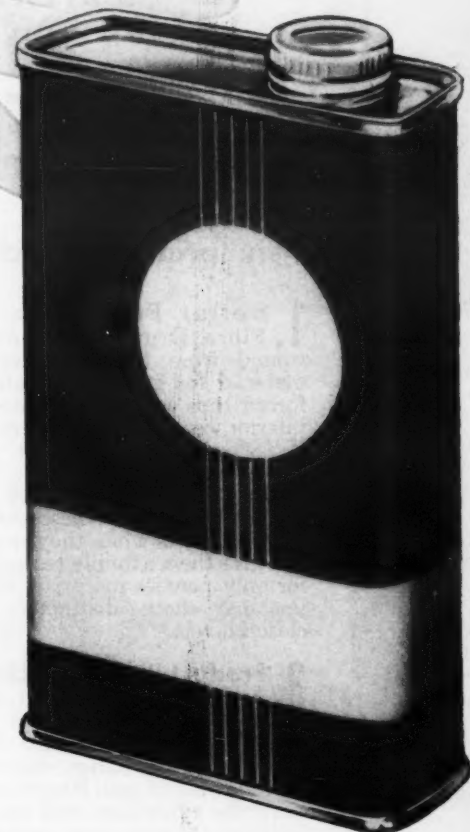
Bulk and large lot weighing

Printed in two colors, six-page folder pictures several scales and arrangements for making bulk weighings or large lot weighings. Control panels are also covered in description.

Bul 3649A is issued by Richardson Scale Co., Dept. CP, Van Houten Ave., Clifton, N. J. When inquiring specify CP 4379 opp. last page.



*and our "F" style
cans will do a job
for you, too!*



Your package has to "speak up" for sales, or it doesn't stand a chance in today's fast competition. That's why Continental's "F" style cans are the choice of so many manufacturers of waxes, polishes and other petroleum products. For, in addition to sturdy, easy-to-use construction, these containers offer you color and brilliance that only Continental master lithographers can achieve.

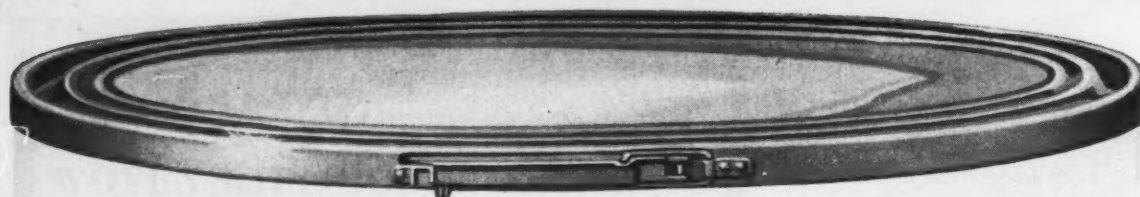
We'll start things off right by delivering all the "F" style cans you need, exactly when you need them. Sizes from four-ounce (spout top) to one gallon. Then, if you want help with research or engineering, it's available anytime as part of our Tailor-Made Package Service. Why not let "F" style cans do a selling job for you? Call soon.

CONTINENTAL © CAN COMPANY

Eastern Division: 100 E. 42nd St., New York 17
Central Division: 135 So. La Salle St., Chicago 3
Pacific Division: Russ Building, San Francisco 4



When inquiring check CP 4380 opposite last page



6

THINGS EVERY SHIPPER SHOULD KNOW ABOUT

RHEEM FIBRE DRUMS

—six profitable ways to solve packaging problems

1. Better Protection—Rheem Fibre Drums are convolutely wound from layers of heavy-duty material for greater strength. Reinforced tops and bottoms, and tested interior coatings, give extra protection where it's needed most.

2. Smarter Appearance—Colorful silk-screened messages can sell your products while they're shipped, and give them a family resemblance—for only pennies more per drum. Or, you may choose distinctive identification labels.

3. Product-Planned Linings—Whatever your product, its properties or special resistance requirements, Rheem research stands ready to develop the linings, coatings and barriers best for you. Rheem engineers have the experience and the testing facilities to keep your product pure and safe in shipment.

4. Ease of Handling—Rugged as they are, Rheem Fibre Drums are surprisingly light in tare, and easy to open or close. Well-spaced diameters allow convenient drum nesting—to cut your overall storage space needs and handling costs.

5. Wide Selection—Rheem offers a full range of diameters, sizes and types of fibre drums. All-fibre and fibre-metal drums in 1- to 60-gallon sizes. Rheem has the right drums, drum lids and interior coatings for your particular product.

6. Nationwide Availability—Rheem sales offices and warehouses, eight of them, are located in every major marketing area. Each office is staffed with packaging engineers. Adequate inventories are maintained to provide prompt delivery and service to meet your fibre drum requirements.

You can rely on **Rheem** to solve your packaging problems



For expert packaging counsel, write the Rheem Office nearest you:

477 Madison Ave., New York 22, N.Y.	4361 Firestone Blvd., South Gate, Calif.	1025 Lockwood Dr., Houston, Texas	Highway 25, 1701 W. Edgar Rd., Linden, N. J.
801 Chesley Ave., Richmond, Calif.	5001 Jefferson Hwy., New Orleans, La.	7600 Kedzie Ave., Chicago 29, Ill.	Box 6718, Sparrows Point 19, Md.

FIBRE DRUMS, STEEL DRUMS AND PAILS, SPECIAL EQUIPMENT CONTAINERS

When inquiring check CP 4381 opposite last page

PACKAGING

Protects pharmaceuticals from contamination during filling process . . .

exhaust through working orifice prevents entry of unfiltered air

Uses: Filling operations on pharmaceuticals and similar materials needing sterile conditions.

Features: Air from intake at top of hood passes bank of ultraviolet tubes, with air filters immedi-



Filling operations are performed in glass-enclosed area

ately beneath. Air is exhausted through operator's opening at side of unit.

Description: Hood is of stainless steel. Work area is totally enclosed in glass except for space open for manipulations. Hood was fabricated to specs.

(Hood is product of Westronic Manufacturing Co., Dept. CP, 6555 W. State St., Milwaukee 13, Wis. . . . or for more information check CP 4382 on sheet opposite last page.)

How to specify, test aerosol packages

Fifty-two page manual explains specifications and test procedures for aerosol packages and material. Flammability of product, filling procedures, pre-marketing product checks, and detailed standard tests are included.

"Manual for Vendors and Fillers of Aerosols and Pressurized Packages" may be obtained by remitting 50 cents direct to Aerosol Div., Chemical Specialties Manufacturers Assn., Inc., Dept. CP, 50 E. 41st Street, New York 17, N.Y.

Now...a machine that prints your product as you make it



Here's the practical modern way to print trademarks, brand names, part numbers, code-dates, continuous or repeated designs on any material processed in a web — sheathing, wall-board, screening, linoleum, gasket material, paper, plastics, cloth, laminates, etc. Gottscho web-printers operate as part of your present production set-up, eliminate cost of printing as a separate operation. Clean, permanent impressions assured on anything from .001" to 1.0" thick...flexible or rigid...1" to 74" wide. Uses fast-drying inks of any color for light or dark surfaces.

Write for details

Gottscho

ADOLPH GOTTSCHO, INC.
Dept. N, Hillside 5, N. J.

Automatic
CODING, MARKING,
IMPRINTING
MACHINES

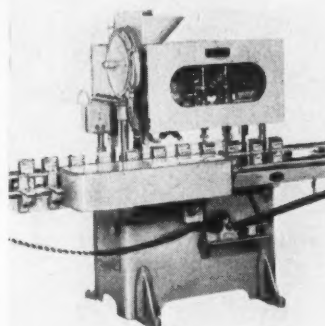
In Canada: RICHARDSON AGENCIES, LTD., Toronto & Montreal
When inquiring check CP 4383 opposite last page

PACKAGING

**Seals 60 cans per minute
direct from filler**

Uses: For cans using standard one inch seal, unit seals up to 60 per minute to quart size — somewhat slower for gallon size.

Features: Automatic sealer accepts cans directly from filling equipment — loses no time in handling.



Sealer loses no time in handling
—accepts cans directly from filler

Description: Operation requires only adjustments for can size to be sealed. Changeover from one size to another requires only few minutes. Overall height of unit is 7 feet — conveyor height is 33 inches.

(Automatic sealer is manufactured by Resina Automatic Machinery Co., Dept. CP, 572 Smith St., Brooklyn 31, N. Y. . . . or for more information check CP 4385 on form which is located opposite last page.)

**Explains dispenser
for steel strap**

Printed in two colors, four-page bulletin explains dispenser for round steel strapping. Typical applications are suggested and dispenser itself is illustrated.

"Model G Round Steel" is issued by Gerrard Steel Strapping Div., U. S. Steel Corp., Dept. CP, 2915 W. 47th St., Chicago, Ill. When inquiring specify CP 4386 opposite last page.

you can

Soda Ash

ACETAMIDE

Phenol

Alum

CALCIUM
CARBONATE

ABIETIC
ACID

pack

Gallie
Acid

METHYL
CELLULOSE

PEARL MOSS
(IRISH MOSS)

ship

DIMETHYLUREA

INHIBITORS

IRON OXIDE

Adipic
Acid

Talc

store

Waxes

Vanillin

RESINS

almost any

Calcium
Chloride

SALICYLIC
ACID

GUM ARABIC

Umbers

dry chemical

Citric
Acid

in CHASE

BLACK LEAD
(GRAPHITE)

Nickel
Nitrate

Benzoic
Acid

AMMONIUM
CHLORIDE

INSECTICIDES

MULTIWALL

Xanthane

Yeast

Barium
Chloride

bags

FULLERS
EARTH

Borax

and save money doing it!

Chase Multiwall bags give your dry chemicals (effluorescent, deliquescent or anhydrous) *complete* protection—yet, they cost far less than fiber drums, metal containers, or barrels...and they save up to 75% in storage space, too. Available in any combination of plies, with or without liners, tailored to YOUR exact requirements.

CHECK WITH CHASE—WHATEVER YOUR PACKAGING NEEDS

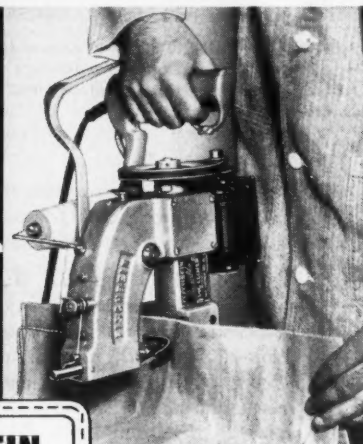
**CHASE
BAG** COMPANY

General Offices: 309 W. Jackson Blvd., Chicago 6, Ill.

Prompt shipments and personal service from 32 nationwide branch plants and sales offices.

When inquiring check CP 4387 opposite last page

FOR
**FAST,
SECURE,
LOW COST**
BAG CLOSING



**FISCHBEIN
Portable
BAG CLOSER**

- A truly portable bag closer . . . Weighs only 10½ pounds.
- Requires no installation . . . plug into any outlet.
- Handles textile and paper bags.
- Simple to operate and maintain.
- Lowest priced bag closer on the market.

When inquiring check CP 4384 opposite last page

FOR DETAILS,
MAIL THIS COUPON NOW
DAVE FISCHBEIN CO.
Dept. 9B
2720 30th Ave. So.
Minneapolis 6, Minn.

Name.....

Firm Name.....

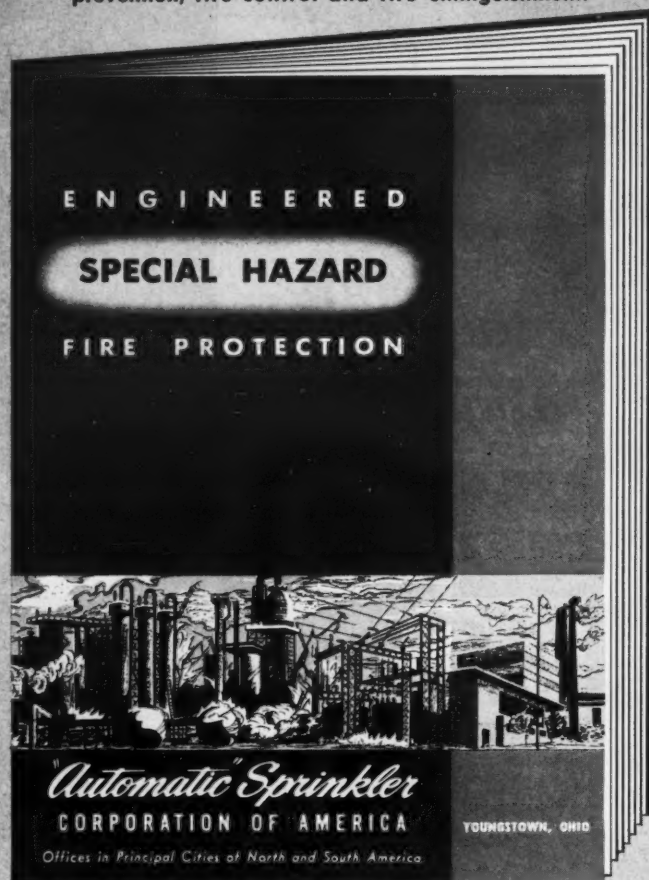
Address.....

City.....

State.....

Send For This FREE Catalog!

... 28-page illustrated booklet contains factual information on methods of fire detection, fire prevention, fire control and fire extinguishment.



Complete Up-To-The-Minute-Data On

Application of SPECIAL HAZARD Fire Protection
Economics of SPECIAL HAZARD Fire Protection
Methods of Fire Detection
Methods of Fire Prevention, Control and Extinguishment
"Automatic" FIRE-FOG Systems
"Automatic" AIRFOAM Systems
"Automatic" CO₂ Systems
"Automatic" DRY CHEMICAL Systems
SPECIAL HAZARDS FIRE CONTROL
and EXTINGUISHMENT CHART

CLIP
AND MAIL

"AUTOMATIC" SPRINKLER CORPORATION OF AMERICA

Dept. 10 — Box 360 — Youngstown 1, Ohio

Please furnish me with a copy of your Catalog 73—

"Engineered SPECIAL HAZARD Fire Protection."

Name _____
Title _____
Company _____
Address _____
City _____ Zone _____ State _____

When inquiring check CP 4388 opposite last page

safety



Time-stop sequence illustrates technique's effectiveness: (left) 11:20:16 — compressed air is introduced in bottom of a tank of burning oil, agitating tank's contents. (center) 11:20:28 — blaze is now under control. (right) 11:20:40 — 24 seconds after agitation was first applied, fire is out

Using various methods of agitation,
Koppers safety engineers have
succeeded in . . .

**extinguishing
oil fires by
"drowning" flames
— within
22 seconds**

CCLIMAXING two years of experiments, safety engineers at Koppers Company have demonstrated a fire control technique capable of extinguishing a raging fire in an 8000-gallon tank of coal chemicals in less than a half-minute. Their method: vigorous agitation of burning oil — "drowning" the flames in cooler liquids from bottom of the tank.

Prior to Koppers' development, method had not been applied to control of coal chemical fires, although a considerable amount of work along this line had been done in the petroleum industry, notably by Socony-Mobile.

Engineers deliberately fired tank of creosote oil. Fire was allowed to burn for a short time to reach full intensity. Then, twenty-two seconds after pumps were started, fire was out because unignited chemicals at bottom of tank were circulated to the top



so quickly that temperature was reduced below the flash point.

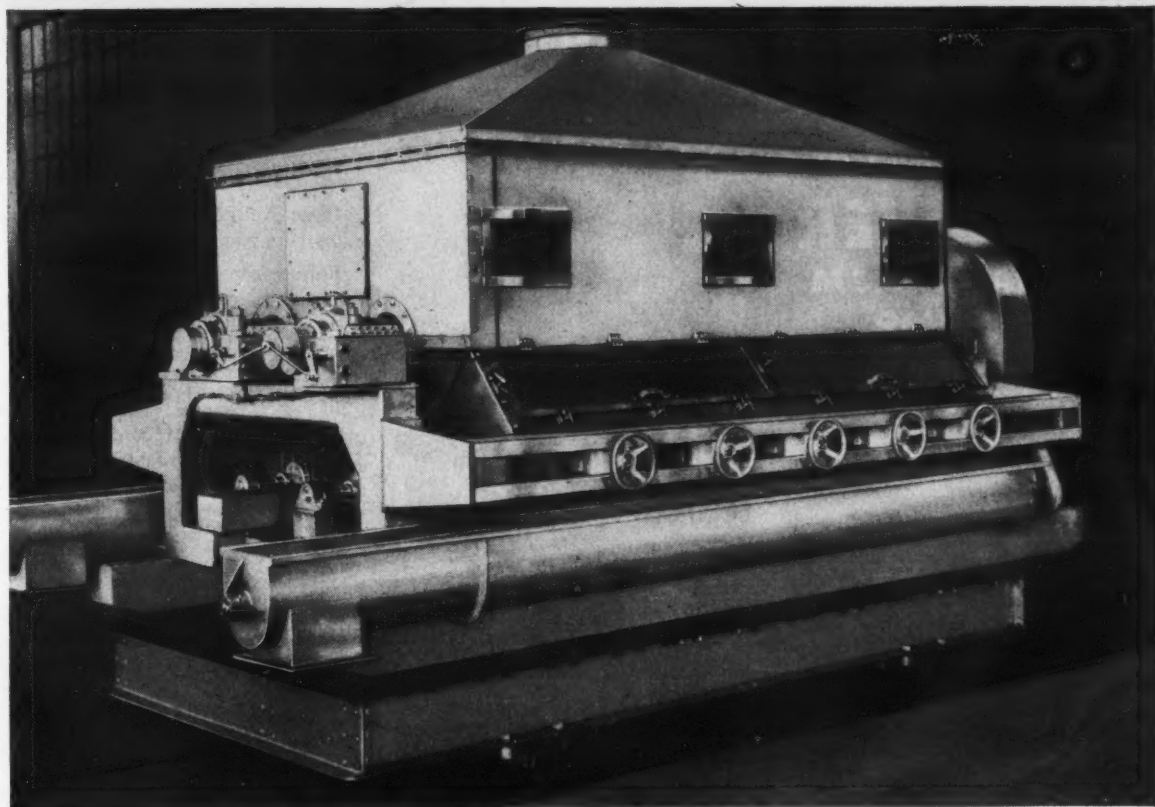
Agitation was accomplished by several methods. In separate tests compressed air and nitrogen were successfully used, despite fact that air ordinarily spreads flames. In one demonstration fire was extinguished using only compressed air through normal inlets provided to assist in regular mixing operations.

Another method — developed by Koppers itself — was agitation by recirculation of liquid in tank. This was accomplished by pumping material from, and then back into, tank through a jet mounted in center bottom of tank and directed upwards, thus stirring contents.

Results of the tests: In all cases complete extinguishment was attained in between 22 and 46 seconds.

Several tests have also been made on even more volatile liquids in smaller tanks. Although complete extinguishment was not always possible, good control of flames was maintained. Conventional fire-fighting equipment then quickly extinguished the already controlled flames.

(Data on fire control method is available from Koppers Company, Dept. CP, Koppers Bldg., Pittsburgh, Pa. . . . or for more information check CP 4389 on form opposite last page.)



This Enclosed Double Drum Dryer eliminates hazards of dust, toxicity and fire

Here is the dryer that was designed especially for dry materials that present a dust, a fire, or a toxic hazard. Such materials include dyes, herbicides, and other products that are dusty when dried, or release toxic solvents in processing. The dryer, conveyors and dry material hoppers are completely enclosed, and the casing is connected to the vapor stack. Solvents can be reclaimed by connecting the vapor outlet to a condenser, and dust entrained in the vapor can be recovered by adding a vapor scrubber.

In addition to safety from hazards, this Enclosed Double Drum Dryer offers all the features and economy of drum drying. It is available in a wide range of types, sizes and feeding devices.

It will pay you to investigate these safe, hazard-proof drum dryers for your operations. Why not let us test a pilot plant batch of your hazardous material in our Research and Testing Laboratory? Based on the results obtained, we will make recommendations.

BLAW-KNOX COMPANY

BUFLOVAK EQUIPMENT DIVISION

1645 Fillmore Avenue, Buffalo 11, N. Y.

Makers of process equipment engineered for any temperature, pressure, capacity, reaction

A Complete Process Equipment Service

Dryers of every description constitute but one phase of Blaw-Knox Process Equipment design, engineering and fabrication service for the chemical, food, pharmaceutical, plastic and resin, petroleum, rubber and other industries:

EVAPORATION • DRYING • FLAKING
MIXING • IMPREGNATING • REACTION
VULCANIZING • SOLVENT RECOVERY
CRYSTALLIZATION • EXTRACTION
DISTILLATION • POLYMERIZATION
GAS CLEANING • GAS ABSORPTION
VAPORIZATION • CONDENSATION
STERILIZING • HEAT TRANSFER
LOW AND HIGH PRESSURE PROCESSING



When inquiring check CP 4390 opposite last page

IF IT'S TOUGH TO PUMP...

You need a **SHRIVER DIAPHRAGM PUMP**

for

- ✓ Corrosive
- ✓ Abrasive
- ✓ Viscous
- ✓ Thick • Heavy
- ✓ Delicate
- ✓ Hazardous Materials

Bulletin 137 tells why.

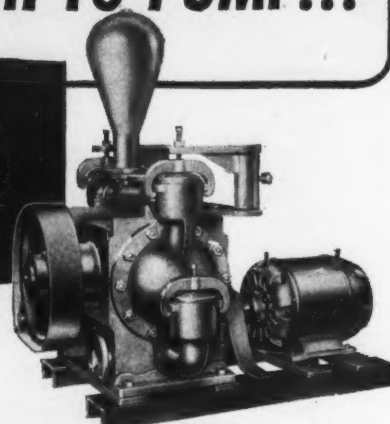
T. SHRIVER & COMPANY, Inc.

Filter Presses • Filter Media • Diaphragm Pumps

846 Hamilton St., Harrison, N. J.

Sales Representatives in
Decatur, Ga.—Houston, Tex.—St. Louis, Mo.
San Francisco—Montreal—Toronto

When inquiring check CP 4391 opposite last page



POINTS TO REMEMBER

- No contact between fluid handled and mechanical parts of pump.
- No packings, hence no leakage.
- Easy to inspect and clean.
- Minimum maintenance cost.
- Parts contacting fluid made of any metal, rubber or synthetic resin lined.
- Ample pressure; wide capacity range.

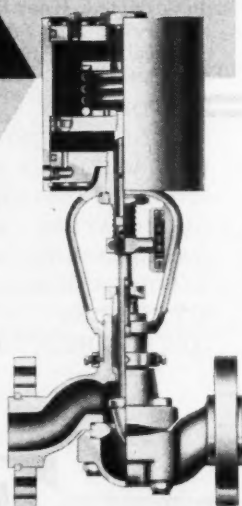
For Remote Shut-off Applications...

ANNIN CYLINDER VALVES

provide the
complete
answer!

absolute shut-off dependability and safety with **ANNINICO TEFSEAL SEATS** proven in dangerous services, such as Liquid Oxygen, Fuming Nitric Acid, Liquid Nitrogen and CO₂, Fuels and other FLUIDS at all pressures and temperatures -300° to +450° F.

ANNIN

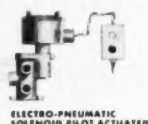


Control VALVES

**THE ANNIN
COMPANY**

6870 EAST TELEGRAPH ROAD, LOS ANGELES 22, CALIFORNIA

When inquiring check CP 4392 opposite last page



ELECTRO-PNEUMATIC
SOLENOID PILOT ACTUATED



3-WAY OR 4-WAY
MANUAL AIR ACTUATED



PNEUMATIC CONTROLLER
ACTUATED

...with these advantages:

- Positive shut-off
- Fast action
- Spring to open or
- Spring to close
- Globe, angle & 3-way bodies
- Carbon steel and all cast and forged alloys available
- Metal seats for high temperatures

SAFETY

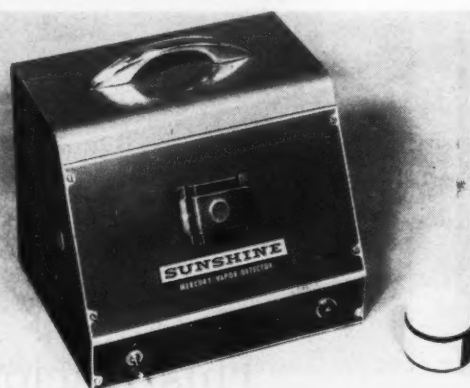
**Provides continuous sampling
for mercury vapor . . .**

detects minimum toxic amounts in two hours

Uses: Indicates presence of toxic quantities of mercury vapor.

Features: High concentrations of toxic vapor can be detected in less than one hour while minimum toxic quantity (1.3 parts per hundred million) will be noted in two hours.

Description: Detector utilizes selenium sulfide to indicate mercury vapor. When yellow selenium sulfide is placed in contact with vapor, black mercuric sulfide is formed. Degree of reaction, evident



Portable unit detects toxic amounts of mercury vapor in six hours

in degree of darkening, is dependent upon mercury concentration, time of exposure, temperature and velocity of air passing over sensitive area.

Constant temperature is maintained by electric heater and thermostat. Small electric motor passes air over selenium sulfide-coated paper. Discoloration of paper strip is compared to calibrated color chart, indicating degree of concentration.

Calibrated color chart, provided with each detector, provides determinations for mercury vapor quantities in parts per hundred thousand parts of air, for exposure periods from one to 24 hours.

(Detector is product of Sunshine Scientific Instrument Co., Dept. CP, 1810 Grant Ave., Philadelphia 15, Pa. Check CP 4393 opposite last page.)

Worker protection equipment

Illustrated 64-page catalog shows all sorts of goggles, face guards, masks, helmets. Specifications and prices are included.

Cat 32 is issued by Sellstrom Mfg. Co., Dept. CP, 621 N. Aberdeen, Chicago, Ill. When inquiring specify CP 4394 on form opposite last page.

Safety Fights Corrosion with

**PROTECTOSEAL
APPROVED**

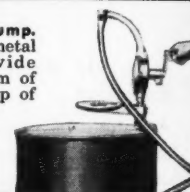
FIRE PREVENTIVE EQUIPMENT

Space-saving Stainless Steel Shelf Can. Oval shape permits maximum number of containers in minimum space; when grasped by handle is in correct position for pouring. Seam-welded construction; double-wall fire baffle in spout; self-closing cap with ball and socket seals liquid vapors and provides pressure relief. Also supplied in terne plate. 1-gallon capacity.



Stainless Steel Wide-Mouth Disposal Can. Large 3 1/4" opening may be locked in open position; seam-welded body with perforated metal fire baffle. Leak-proof spring-loaded cap prevents evaporation and provides pressure relief. Also available in terne plate. Sizes: 2-gals. and 5-gals.

Safety Transfer Pump. Three perforated metal fire baffles provide safety from bottom of suction tube to top of discharge nozzle. Static-proof hose. Steady even flow; fast shutoff.



Safety Storage Cabinet permits storage of 45-gallons of hazardous liquids in any department in approved fire preventive containers of not more than 5 gallons. Complies with specifications of NFPA.

Protectoseal designs and builds All Types of Approved Fire Preventive Equipment for the Storage, Transfer and Plant use of all Flammable Liquids.

Check coupon and attach to company letterhead.
In Canada, Safety Supply Co., Canada

The Protectoseal Company
1932 So. Western Avenue, Chicago 8, Illinois

Send without obligation the descriptive literature checked.

☐ Laboratory Safety Equipment Catalog Sheet

☐ Hazardous Liquid Equipment Chart and Price List of more than 30 Approved Fire Protective Devices

Name _____ Title _____

Company _____

Address _____

City _____ Zone _____ State _____

When inquiring check CP 4395
opposite last page

CHEMICAL PROCESSING

SAFETY

Propels dry powder with Freon . . .

extinguisher rated for Class B and C fires:
does not damage materials with liquids

Uses: For spot control of fires fed by flammable liquids or gas, or caused by electrical short-circuits.

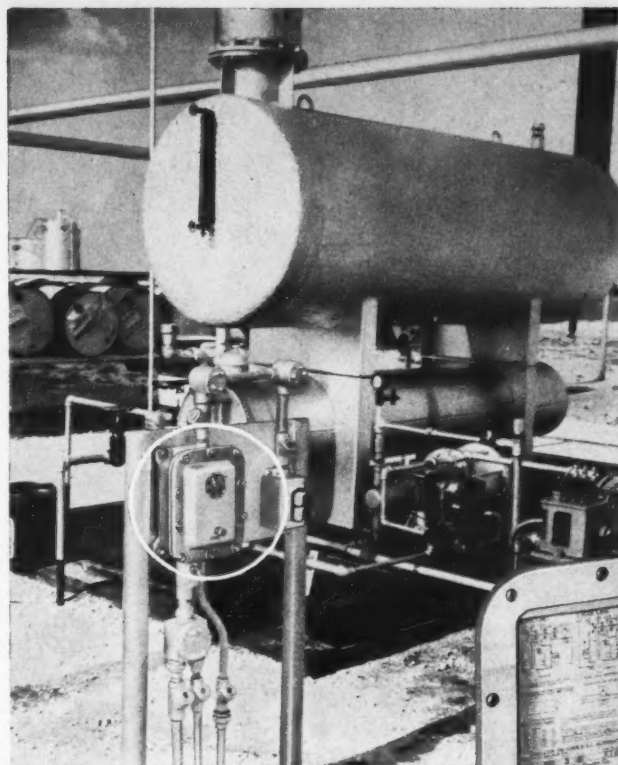
Features: One-shot extinguisher is capable of extinguishing three-square-foot gasoline pan fire, a six- to 10-foot gasoline spill fire, or a five-square-foot pan fire of kerosene or fuel oil. Unit is also effective on class A fires, reducing blaze to embers which can be easily controlled with water.



Dry spray unit kills three-square-foot gasoline pan fire in little more than four seconds

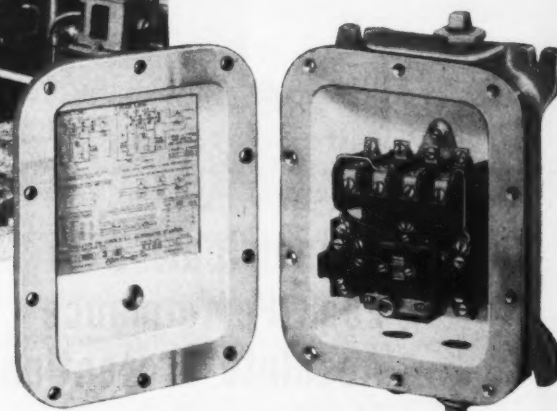
Description: Twelve-ounce aerosol unit contains specially treated bicarbonate of soda — non-toxic and harmless to skin. Material presents no danger from lingering vapors or by-products produced by fire-killing agent.

("Safe" dry fire extinguisher is manufactured by Safe, Inc., Dept. CP, 2800 Parkridge Ave., Marinette, Wis. Check CP 4396 on form which is located opposite last page.)



**The Sign of
QUALITY
MOTOR CONTROL**

Allen-Bradley explosion-proof starter on gas dehydrator Gycal pump in field repressuring plant in Denton Field, Lea County, New Mexico.



Allen-Bradley solenoid starter in Type 7 enclosure for operation in hazardous gas locations. All ratings use double break, maintenance-free, silver alloy contacts.

Allen-Bradley Co., 104 W. Greenfield Ave.
Milwaukee 4, Wis.
In Canada—Allen-Bradley Canada Ltd.
Galt, Ont.

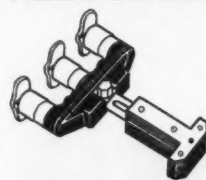
ALLEN-BRADLEY
SOLENOID MOTOR CONTROL
QUALITY

PROTECT HAZARDOUS OPERATIONS with **ALLEN-BRADLEY** Explosion-proof Motor Starters

Type 7 enclosures require many bolts to provide explosion-proof protection. Inspection of explosion-proof starters is not easy; it costs labor and time.

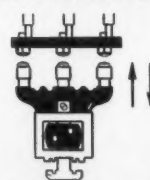
The easiest way to beat this situation is to install Allen-Bradley solenoid starters, because they require no contact maintenance. Only on rare occasions do you have to unbolt the covers of Allen-Bradley explosion-proof starters. With only ONE MOVING PART there are no pins, pivots, or bearings to corrode and cause trouble. The double break, silver alloy contacts need no cleaning, filing, or dressing. Allen-Bradley explosion-proof starters will cut your maintenance costs.

ALLEN-BRADLEY MAINTENANCE-FREE STARTERS ARE IDEAL FOR BOLTED ENCLOSURES



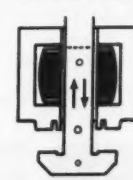
ONLY ONE MOVING PART NO PINS—NO PIVOTS

One-piece plunger carries cadmium silver moving contacts. No flexible jumpers to break.



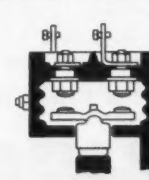
SIMPLE UP & DOWN SWITCHING MOTION

Straight line, up-and-down movement of magnetic plunger opens and closes the contacts.



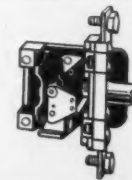
NO COMPLEX LINKAGES NO FLEXIBLE JUMPERS

The magnetic plunger moves friction-free up and down in phosphor bronze guides.



DOUBLE BREAK, SILVER ALLOY CONTACTS

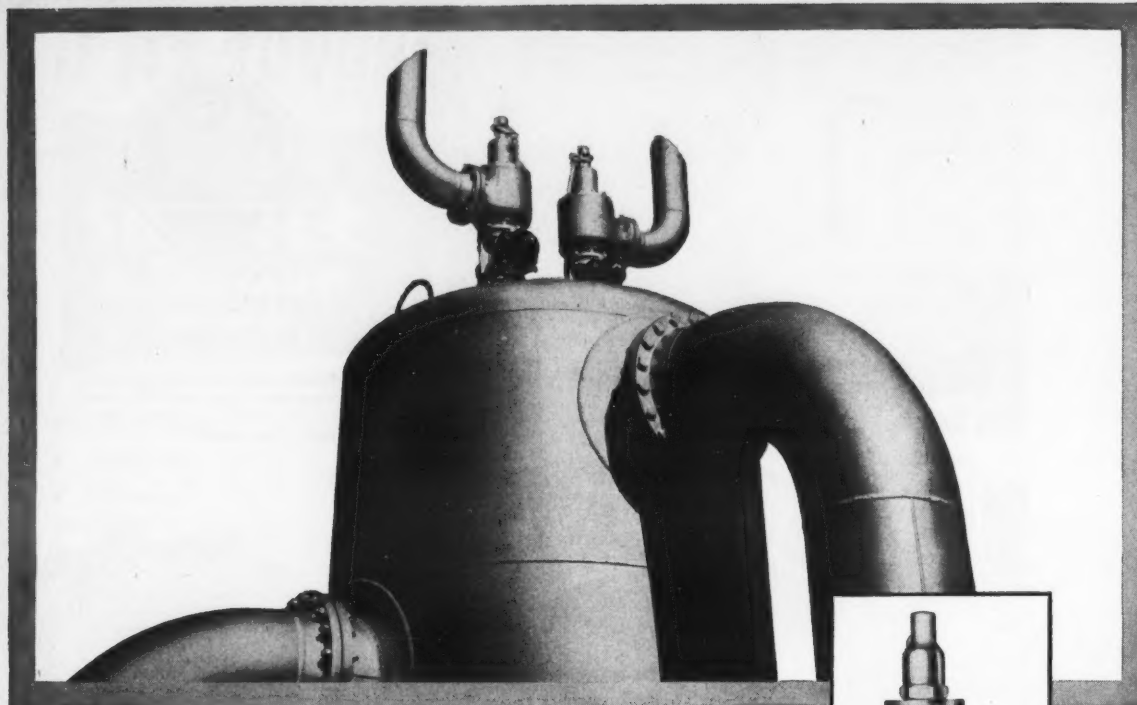
The cadmium silver contacts are always in good operating condition. No maintenance needed.



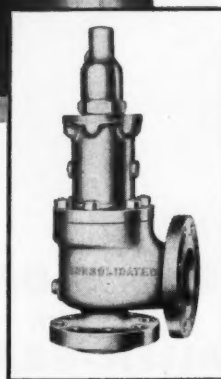
DEPENDABLE THERMAL OVERLOAD RELAYS

Continuously dependable overload protection. Available for manual or automatic reset.

When inquiring check CP 4397 opposite last page



- ★ Economical "2 in 1" Design
- ★ Peak Performance
- ★ Absolute Protection
- ★ Maximum Interchangeability



CONSOLIDATED SAFETY RELIEF VALVES GIVE YOU ALL FOUR — AND MORE

Consolidated Safety Relief Valves satisfy *every* requirement of the most advanced processing facilities. Valve action is *consistently* positive. You get peak performance even where discharge lines are long or there is low "superimposed" back pressure in the relieving system!

The Standard type can be converted to Bellows type *in the field*. Center-to-face dimensions of inlet and outlet are such that you can interchange

these valves with the safety relief valves of other manufacturers. Real flexibility of application that cuts inventory costs! Optically-ground flat seating surface and fewer functional parts than comparable valves contribute greatly to easier, more economical maintenance.

Get top economy and absolute protection with Consolidated Safety Relief Valves. Full range of sizes and pressures available. Write for Catalog 1900 for complete information.

CERTIFIED AND APPROVED. Both Standard and Bellows Valves are approved under API-ASME and ASME Unfired Pressure Vessel Codes and are certified by the National Board of Boiler and Pressure Vessel Inspectors.

In Canada: Manning, Maxwell & Moore of Canada, Ltd., Galt, Ontario

CONSOLIDATED SAFETY RELIEF VALVES

A product of **MANNING, MAXWELL & MOORE, INC.** TULSA, OKLAHOMA
 MAKERS OF 'AMERICAN' INDUSTRIAL INSTRUMENTS, 'ASHCROFT' GAUGES, 'CONSOLIDATED' SAFETY AND RELIEF VALVES, 'AMERICAN-MICROSEN' INDUSTRIAL ELECTRONIC INSTRUMENTS, Stratford, Conn. 'HANCOCK' VALVES, Watertown, Mass. AIRCRAFT CONTROL PRODUCTS, Danbury & Stratford, Conn. and Inglewood, Calif. "SHAW-BOX" AND 'LOAD LIFTER' CRANES, 'BUDGIT' AND 'LOAD LIFTER' HOISTS AND OTHER LIFTING SPECIALTIES, Muskegon, Mich.

When inquiring check CP 4398 opposite last page

SAFETY

Non-asphaltic mastic rated fire-resistive in UL tests . . .

Has low permeability, can be painted without sealing coat

A recently developed mastic, a combination of non-asphaltic fibrated polymers in non-flammable solvents, has been accepted by Underwriters' Laboratories for listing as fire-resistive.

Developed for use as insulation coating, mastic resists ignition by welders and other hazards which might occur during construction when material is wet.



Conventional mastic ignites when hit by flames — fire-resistive material ceases smoldering within seven seconds of flame's removal

Extent of fire-resistant qualities: material is non-flammable when wet. When dry material is exposed to violent kerosene flame, it stops smoldering within seven seconds after flame's removal. Non-flammable solvents make it fire resistant when wet so that mastic material is relatively safe from fire during its entire use-life.

Film retains flexibility and resistance to chemicals indefinitely. As coating for insulation on refrigerated lines and vessels, mastic serves as vapor barrier, with vapor-permeance of .02 perm. Material is available in natural resin color or aluminum, and either can be painted without use of a sealer coat.

(Mastic, designated as 60-60N, is product of Benjamin Foster Co., Dept. CP, 4635-37 W. Girard Ave., Philadelphia 31, Pa. . . or for more information about manufacturer's product, reader may simply check CP 4399 on form which is located opposite last page.)

SAFETY

Light-weight asbestos suit reflects 90% of radiant heat

Aluminized asbestos firemen's suit, made from Underwriters' grade tropic weight asbestos, permits work under heat conditions impossible with conventional asbestos suits. Garments are impregnated with a thin, pliable coating of aluminum. Material reflects 90% of all radiant energy, making it possible for men to stay on the job longer with fewer cooling-off periods.

Aluminizing makes possible the safe use of lighter weight asbestos, greatly reducing weight of the garment. Elimination of "wetting down" further reduces weight of garment.

(Aluminized asbestos clothing is manufactured by Wheeler Protective Apparel, Inc., Dept. CP, 224 W. Huron St., Chicago, Ill. . . . or for more information check CP 4400 on form opposite last page.)



Cartoon above is reproduction of National Safety Council poster 0429-B. For more information write National Safety Council, Dept. CP, 425 N. Michigan Ave., Chicago 11, Ill.

For more information on product at right, specify CP 4401 . . . see information request blank opposite last page.



ALTERNATIVE TO DISASTER . . . fire-resistant oils

Celanes[®] Cellulubes[®] are synthetic oils—straight chemical compounds developed by Celanes to minimize the constant threat of fire and explosions inherent in many industrial operations.

As power transfer fluids in diecasting and other critical hydraulic operations, fire-resistant Cellulubes reduce the ever-present danger of uncontrollable fires due to line breaks or other failures. As cylinder lubricants in air compressor systems, these non-petroleum oils prevent the formation of excessive carbon deposits. Result: danger of fires and explosions is minimized and maintenance costs reduced.

Can a Cellulube solve a safety problem in one of your plants? We will be glad to send you complete use data.

Cellulube fire-resistant functional fluids are the result of research working toward a single objective: how to give industry more productive chemical materials. If you're looking for the extra values that can make your operation safer, your production more efficient, or your product more competitive, we think you'll find the Celanes research approach rewarding. Celanes Corporation of America, Chemical Division, Dept. 591-C 180 Madison Avenue, New York 16, N. Y.

Basic reasons

. for improved products

Acids	Functional Fluids	Polyols
Alcohols	Gasoline Additives	Plasticizers
Aldehydes	Glycols	Salts
Anhydrides	Ketones	Solvents
Esters	Oxides	Vinyl Monomers

Celanes
CHEMICALS

Agricultural, automotive,
aviation, building,
electrical, paper,
pharmaceutical, plastics,
surface coatings, textile



for Chemical Processing Advertisers*

The emblem at right is that of NBP—National Business Publications. You've probably seen it before on our contents page . . . rate card . . . or heading the CHEMICAL PROCESSING listing in Standard Rate & Data. Because we're proud of it.

It signifies that CHEMICAL PROCESSING has qualified for membership in the largest association of technical, scientific and professional journals in the United States. (We're proud, too, that our C. P. executive staff includes a past president of NBP and a member of its Board of Directors.)

But belonging to NBP is more than a feather in our publishing cap. It's an important *plus* for every advertiser in CHEMICAL PROCESSING. Here are the membership requirements. Judge for yourself:

- Unbiased editorial content
- Periodic reader interest evaluation
- Non acceptance of questionable advertising
- Periodic audit of circulation
- Uniform rates to all advertisers

In addition, NBP provides the framework for a continuing exchange of ideas among member publishers. The result: continuing improvement in publishing practices to make CHEMICAL PROCESSING more useful to its readers . . . more productive for its advertisers.

★ Courtesy of the publication MEDICAL ECONOMICS, creator of this copy, here adapted to CHEMICAL PROCESSING.



Chemical Processing

For men who manage
the Chemical Processing Industries

Published by Putman Publishing Company

Creators of PUTMAN-STYLE Magazines
— terse, vital editorial; "hand-picked" circulation;
square, high-visibility format; quality readership;
hence more READER ACTION



SAFETY

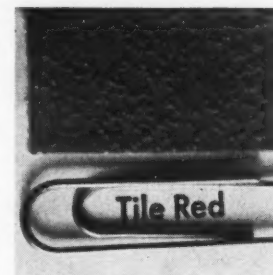
Non-slip floor paint is safe — wet or dry

Specially formulated alkyd resin-base paint is key to floor coating with extremely hard surface. Formulation also makes it possible to use this coating on floors that are wet at the time of painting. Alkyd resin will set up on wet surface. When cured, it has resistance to water penetration. Coating may be applied by brush or spray. Dipping is satisfactory for small objects. Coating cures to about 8 or 9 mils per coat.

In order to provide a non-slip surface, even when wet, coating contains a silica derivative (50 to 60 mesh) which remains suspended in the coating during shelf life. After curing, these granules provide a rough open-sand-paper-like surface.

Cured coating is resistant to alkalis, food acids, oils, water. Coverage is about 200 sq ft per gallon. Drying time is about one hour. There is no unpleasant odor during drying of the coating.

(Gray, tile red, and black floor coatings are manufactured by Lawton Products, Dept. CP, 228 N. La-Salle St., Chicago 1, Ill. Check CP 4402 opp. last pg.)



Silica granules are clearly evident in this slightly larger than actual size photo

Administers oxygen on spot — useful for resuscitation or continuous flow

Uses: Portable unit is recommended for emergency use in industrial plants.

Features: Unit is designed for emergency administration of oxygen for resuscitation or continuous flow therapy.

Description: Unit consists of carrying case, yoke for medical-type cylinder valves, needle valve control with pressure indicating gage, tubing, collector bag, inhaler assembly modified to limit positive pressure to approximately 20 mm Hg, face mask, and cylinder wrench.

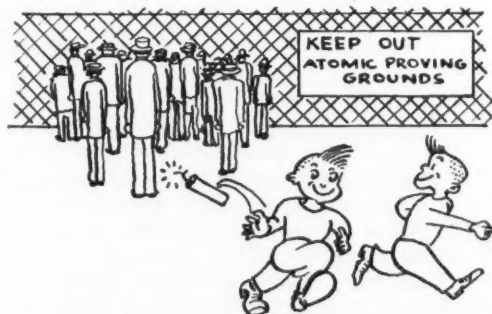
When used for resuscitation, the needle valve is opened wide to permit bag to fill while mask is held in position on patient's face. Pressure is then applied to bag by squeezing — forcing oxygen into patient's lungs. For continuous flow therapy



Unit is designed for emergency administration of oxygen for resuscitation or continuous flow therapy

administration, flow of oxygen is limited to amount necessary to keep bag slightly distended through inhalation phase of patient's respiration.

(Portable Oxygen Unit is manufactured by Ohio Chemical & Surgical Equipment Co., Div. of Air Reduction Co., Inc., Dept. CP, 1400 E. Washington Ave., Madison 10, Wis. Check CP 4403 opposite last page.)



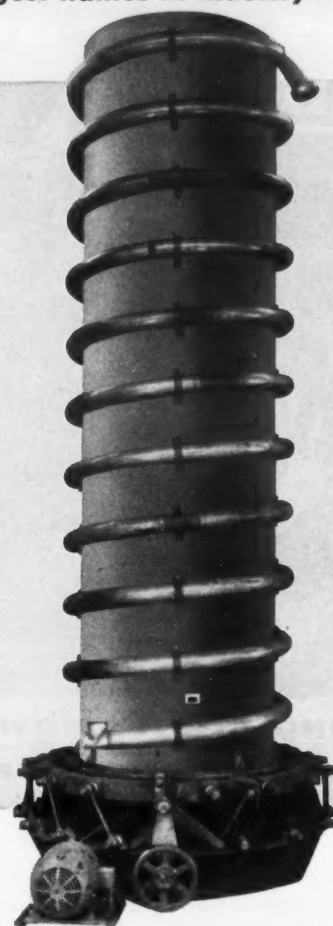
Credit the cartoon above to reader Sam Mattleman, Atlantic Refining Company, Philadelphia. We've sent a \$10 check to him for it.

DO YOU HAVE A CARTOON IDEA?

Your gags can make money for you. Look for the details on page 23.

CARRIER does the "IMPOSSIBLE" for the biggest names in industry!

*Sorry - impossible
to get installation
photo in U. S.
Government Arsenal*



How NOT to get a bang out of rocket fuel powder

YOU can't see it—but super-dangerous rocket fuel powder is what's conveyed inside that spiralling tube. It used to be handled by screw conveyors and bucket elevators. Catch was that the powder sometimes came in contact with oil or grease, causing violent explosions.

After several of these dangerous explosions had caused heavy damages, Carrier was called in. Within a month, Carrier engineers had come up with the answer in the special Spiral Natural-Frequency Conveyor shown above.

It's stainless-steel throughout, with totally-enclosed conveying tube. It's grounded, air-tight and

self-cleaning. It vibrates the powder gently, quickly and safely to the top discharge where it's fed onto another Carrier Natural-Frequency Conveyor—a covered, horizontal unit that's also stainless-steel, air-tight and grounded. The whole operation is now quicker, cleaner and more efficient. Most important, of course, *danger has been minimized!* Chances are that danger isn't the

big headache in your operation. But whatever it is—if it involves handling and processing, Carrier Natural-Frequency Vibrating Equipment may be the answer. Remember — Carrier developed the world's first really modern vibrating equipment . . . knows more about its practical industrial applications than anyone else. May we talk with you soon?

CARRIER NATURAL-FREQUENCY CONVEYORS

Carrier Conveyor Corp., 201 North Jackson St., Louisville 2, Ky.

When inquiring check CP 4404 opposite last page

this "Buffalo" pump moves your acids on rubber



"Buffalo" Rubber-Lined Pump with upper half of casing removed.

-REDUCING COSTLY DOWN-TIME -ELIMINATING EXCESSIVE REPLACEMENTS

If you are pumping highly corrosive liquids, or liquids containing abrasive solids, you may be paying the high price of short pump life. However, where such severe service destroys ordinary pumps in a hurry, "Buffalo" has the answer: *what acids can't touch, they can't hurt.* And in this "Buffalo" Pump, the liquid contacts nothing but rubber, vulcanized to the impeller and passages.

Pump life is multiplied many times and the cost of rubber lining is negligible when compared to the savings in down-time and replacements. Have us mail you Bulletin 982 — see this and the other "Q" Factor* features that save you money and troubles when you specify "Buffalo" Chemical Pumps.

*The "Q" Factor — the built-in Quality which provides trouble-free satisfaction and long life.



BUFFALO PUMPS

DIVISION OF BUFFALO FORGE CO.

524 Broadway Buffalo, N. Y.
Canada Pumps, Ltd., Kitchener, Ont.
Sales Representatives in all Principal Cities

A BETTER CENTRIFUGAL PUMP FOR EVERY LIQUID

When inquiring check CP 4405 opposite last page

briefs

from contemporary publications

High-temperature water

High-temperature water is easily distributed. This paper deals with piping, distribution design, space heating, process heating, and use of accumulators — all for high-temperature water. Ten pages, three tables, eight figures, six photographs. ("Air Conditioning, Heating, and Ventilating," November 1955, page 86.)

Whitening effects

Undyed cotton fabrics were laundered repeatedly with detergent solutions that contained perborate bleaches and fluorescent dyes. A study of resulting whitening effects is reported. Five pages, four tables, three figures, seven references. ("American Dyestuff Reporter," Nov. 7, 1955, page P786.)

Bleaching of oils

Hydrocarbon oils are bleached selectively by means of air blown through oil at 150 to 200°C in the presence of metallic sodium. Sludge is coagulated and removed by gravity settling or centrifuging. Eight pages, three tables, four figures, two references. ("Canadian Journal of Technology," November 1955, page 426.)

Degradation of rubber

Thermal degradation of rubber by oxidative and nonoxidative means was investigated. Covered are degradation of vulcanized and unvulcanized natural rubber, factors that affect oxidizability, and degradation of tetramethylthiuram disulfide vulcanizates. Ten pages, two tables, 21 figures, 30 references. ("Industrial and Engineering Chemistry," December, 1955, page 2565.)

Bleaching sulfate pulp

Chlorine dioxide bleaching of semibleached sulfate pulp is covered under headings of effects of time, amount of chlorine dioxide, consistency, pressure, temperature, caustic addition, and initial brightness. Eight pages, 12 tables, seven figures, 15 references. ("Tappi," November 1955, page 641.)

Organopolysiloxanes

Radiated organopolysiloxane elastomers show properties parallel to those of radiated organic polymers and exhibit excellent performance at high temperatures. Six pages, 17 tables, two figures, 11 references. ("Industrial and Engineering Chemistry," November 1955, page 2388.)

Fluoridation of water

Fluoridation of city water is discussed under headings of constant water quality, feeders, and types of fluoride. Three pages, two figures, two photographs. ("The American City," December, 1955, page 96.)

Tonnage ozone

Engineering problems in using tonnage ozone are discussed under headings of explosion, mechanism of detonation, a system for suppressing explosions, ozonide hazards, and ozone toxicity. Five pages, six figures, three photographs. ("Chemical Engineering Progress," November 1955, page 523.)

Synthetic fuels

This survey of the future of synthetic liquid and gaseous fuels considers energy from

abstracts of pertinent articles in other industrial publications . . . selected by CP editors as a service to you . . .

mineral fuels, energy from atomic and solar sources, predictions to 1975, and factors that affect cost and availability. Five pages, one table, six figures, 11 references. ("Combustion," November 1955, page 49.)

Corrosion by H₂S

Tests show that anodic and cathodic reactions are the vital ones in the mechanism of hydrogen sulfide corrosion. Electrochemical properties of corroding solution and of corrosion products are important. Five pages, three figures, eight references. ("Corrosion," November 1955, page 497t.)

Better water

Methods of removing the following constituents from water are covered: sediment, turbidity, color, taste, odor, micro-organisms, soluble iron and manganese, organic iron and manganese, silica, gases, and hardness. Seven pages, three photographs. ("Factory," November 1955, page 128.)

Lubrication

The following methods of lubrication are compared: force feed, oil ring, wick, mist, oil jet, and cross feed. A guide for selecting a method is given. Six pages, one table, two figures. ("Product Engineering," December, 1955, page 183.)

Controlled maintenance

Cutting costs through control of maintenance as practiced by the US Navy is reported. Organization, continuous inspection, job estimates, and scheduling personnel are discussed. Eight pages, 15 figures. ("Plant Engineering," December, 1955, page 99.)

Modern pesticides

Basic and applied research are focused on development of pesticides. A careful analysis of mechanism of action of systematic insecticides, especially Systox, is given. Five pages, one figure, 11 references. ("Agricultural Chemicals," December, 1955 p. 40.)

Faster, better reading

An authority on reading gives practical suggestions for increasing the rate and degree of comprehension of one's reading in the first of a series of nine articles. Six pages. ("Paper Trade Journal," December 12, 1955, page 40.)

Increasing productivity

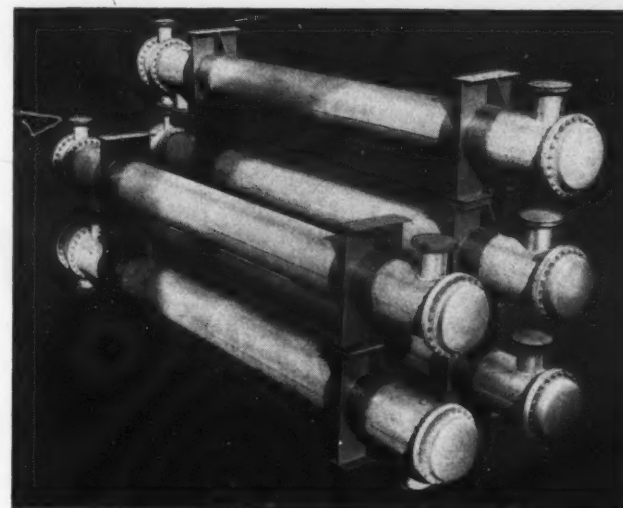
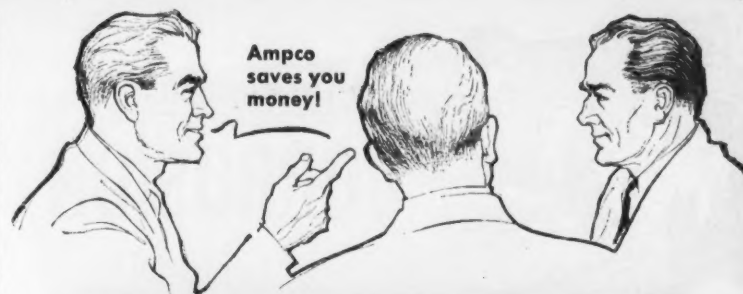
Four steps in increasing productivity in a routine control laboratory are: establishing the norm, measuring daily output, analyzing and rating, and taking positive action. Five pages, four tables, two figures. ("Petroleum Processing," December, 1955, page 1914.)

Optical brighteners

From Switzerland comes a treatise on optical brighteners in detergents. Tables combined with plots show effects on various textiles. Five pages, three tables. ("Soap and Chemical Specialties," December, 1955, page 58.)

Electric shock

How accidents happen, how electricity affects man, and how to prevent electrical shocks and burns are discussed. Cartoons are used to illustrate. Three pages, 12 figures. ("Power," December, 1955, p. 127.)



AMPCO* Metal reduced costs 25% on Downingtown-built coolers

Fabricating these five 20" x 20' coolers from any alloy calls for real skill. But when a major chemical company asked if they could be built from Ampco 8, Downingtown Iron Works, Downingtown, Pa. had the answer. From previous experience with pressure vessels and heat exchangers, Downingtown knew how to fabricate Ampco Metal. That's why each of these 282 tube units is made completely from Ampco 8 — except the channel covers, which are Ampco-lined, and the bolts.

The saving in initial cost was a fat 25 percent. And these coolers will continue to yield savings for many, many years. Here's why:

Ampco Metal has excellent corrosion resistance to many acids, caustics, and such troublesome media as polluted sea waters, bayou water, and plant waste waters. The material is ASME code-approved to 500° F. It has excellent heat-transfer rates. It is an alloy that withstands cavitation-pitting and erosion from suspended solids. And it's tough, maintaining good physicals at elevated temperatures.

Ampco Metal is available in most any form you need for economical fabrication. Start *your* savings program now by using Ampco Metal for your corrosion-resistant service. Write us for full details.



Sole Producer of
Genuine Ampco Metal

AMPCO METAL, INC.

Dept. CP-3 • Milwaukee 46, Wisconsin

*Reg. U. S. Pat. Off.

West Coast Plant
Burbank, California

PS-17

When inquiring check CP 4406 opposite last page



Their problem? . . .

CORROSION

of industrial
equipment, materials

Their location? . . . anywhere in the nation . . .

their dependable, economical answer . . .

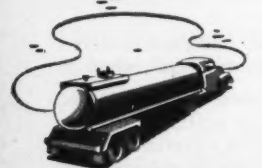
ARCO RUBBER PROTECTIVE LININGS and COATINGS



PROCESSING



STORAGE



TRANSPORTATION



ANYTHING CAN BE COVERED
WITH RUBBER — BY ARCO

● Whenever there's the slightest evidence of corrosion, there's the beginning of future losses . . . down-time, equipment and customers.

Even before this menace appears, ARco Engineers and ARco Anti-Corrosion Rubber Protective Coatings should be considered . . . for the long term savings they will deliver for a reasonable initial cost.

Regardless of your location . . . ARco Engineers will design, fabricate, insulate, and erect complete ventilation, storage, and processing installations . . . or, work with your equipment supplier in corrosion-proofing your systems.

Yes, due consideration to the problem of corrosion will produce the only logical answer . . . ARco engineering know-how and ARco Protective Coatings!

ARCO FIELD SERVICE UNITS

ARco Field Service Engineers bring complete technical know-how and facilities right into your plant. Permanent installations or equipment too large to move can be fabricated and covered right on the job by our Field Service Units.



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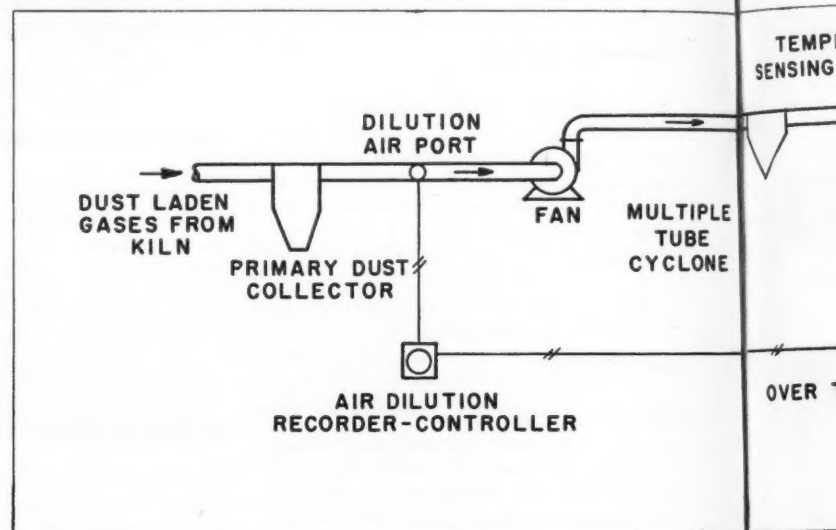
When inquiring check CP 4407 opposite last page

engineering and maintenance

Asphalt plant solves problem of collecting dust
from kiln discharge gas. System, virtually 100%
efficient, handles 30,000 cfm and . . .

*removes over 3000 lb
dust an hour**

*Developed from paper presented at the 48th annual meeting of the Air Pollution Control Association, Detroit, Michigan, by Mr. S. C. Hayes, Cadillac Asphalt Paving Company; and Messrs. N. M. McGrane, D. B. Perlis, Western Precipitation Corporation.



PROBLEM: Dust emission in discharge gases from their kiln was a cause of great concern to officials of Cadillac Asphalt Paving Company, Detroit Michigan. Kiln, used to heat rock and sand to 350-400°F, handles about 230 tons of material per hr. From 28,000 to 31,000 cfm of dust-laden gas leave outlet end of kiln.

Since unit reheats rock and sand that has previously been dried, dust load in gas leaving kiln's primary collector is quite high — ranging from 8 to 16 grains per cu ft. Approximately 94 per cent of the dust is smaller than 10 microns in size. Wet collection systems of various designs were tried without success.

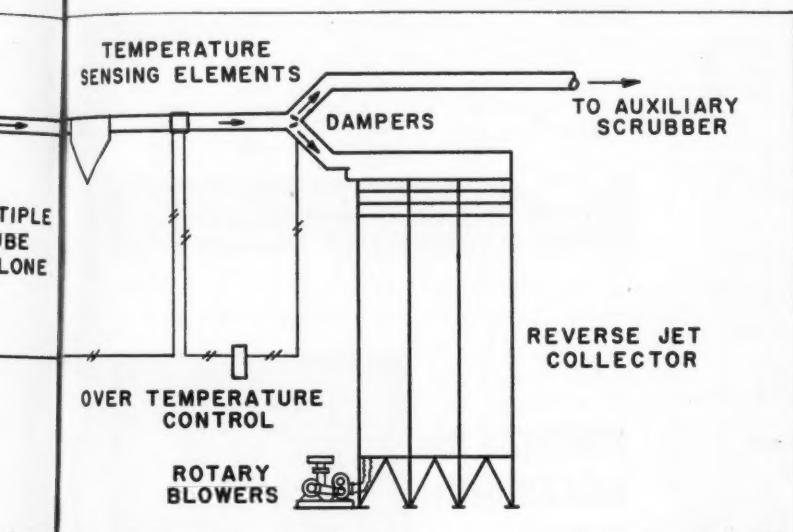
Solution: Engineers installed a dust collection system utilizing a multiple-tube cyclone collector followed by a reverse-jet

collector. Former acts as secondary collector, handling gases direct from kiln's primary collector. Unit consists of 70 9"-diameter cast iron tubes, arranged 10 tubes wide and 7 tubes deep (in direction of gas flow). The small diameter produces high centrifugal force and results in almost complete collection of particles above 10 microns in size. Effluent from collector contains 1.4 to 1.8 grains per cu ft.

Reverse-jet collector provides final cleaning. It consists of three basic units combined to give the desired capacity. Each unit is made up of three sections — making a total of nine sections. There are four dense (3/32" thick) wool felt cylinders in each section. Cylinders measure 20" diam x 19" long. Louvers at top of collector vent cleaned gas to atmosphere.

Operating Data of Dust Collecting System

Gas volume, inlet, cfm	28,000-31,000
Gas temperature, °F	125-180
Dew point, °F	98
Filter ratio, cfm per sq ft	8.5-1 to 9.3-1
Percent reverse-jet operation, approximate	40
Pressure drop across Multiclone, inches water	2.2-2.7
Pressure drop across Dualaire, inches water	3.0-4.0
Inlet dust load to Multiclone, grains per cu ft	8-16
Dust load to Dualaire, grains per cu ft	1.4-1.8
Total dust collection, lb per hr, average	3030

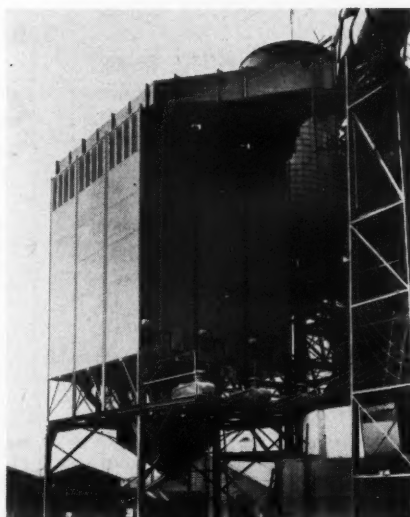


Dust collection system at asphalt preparation plant. Auxiliary scrubber is used only during special periods when wet materials are fed to kiln

Dust-laden gas enters at top of cylinders and is filtered as it passes through the wool felt. Felt porosity is maintained by means of a high velocity jet of clean air applied to the clean side of the felt. This blows the dust out of pores and off the upstream side. Collected dust is carried to hopper below collector.

The air-jet is applied through a series of rings mounted on a traversing mechanism around each of the felt cylinders. Frequency and duration of cleaning are controlled by a pressure switch. When the pressure drop across collector reaches pre-set level, the ring traversing drive mechanism and air blowers start up automatically. When pressure drop reaches pre-set lower level, system shuts off.

Three belt-driven, positive-displacement
(Please turn to page 173)



Reverse-jet dust collector features automatic porosity control. Cleaning air is provided by the three belt-driven blowers

For good chemical resistance—



Use NFM NYLON Filter Cloth

NFM Nylon Filter Cloth
is not affected by

Most common alkalies
Most organic acids
Halogenated hydrocarbons
Aldehydes
Ketones

Alcohols
Carbon Bisulphide
Carbon Tetrachloride
Trichloroethylene
Benzene

In addition, the fiber strength of Nylon ranks first among all others, whether natural or synthetic. It has excellent heat resistance. It is unaffected by mold, fungi and bacteria growths. The extremely smooth surface of Nylon makes for easy cake discharge—even extremely sticky and tenacious cakes separate freely and cleanly from the face of the cloth. This is important since it reduces blinding and increases flow rates and filter capacity.

We also weave filter cloth of VINCEL[†], SARAN, DYNEL, VINYON N^{**}, GLASS, DACRON^{††}, TEFLON^{***}, POLYETHYLENE, ORLON^{*}.

... for your Filter Paper requirements try NETONE Filter Paper. High tensile strength, chemical resistant, high burst factor, abrasion resistant and crease resistant.

Write us for test samples—when you do, tell us about your filter problems.

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When inquiring check CP 4408 opposite last page

TANTALUM...

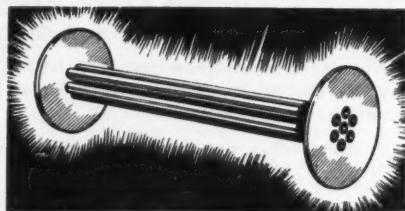
We have it
in abundance
We sell it
SPARINGLY

We make it a rule not to recommend tantalum unless it is the only right material for a particular process. And when we design tantalum equipment, we use it sparingly—an easy task in most instances because tantalum's strength and excellent heat transfer qualities make for minimum bulk. Where other materials of construction can be used in conjunction with tantalum, we specify them.

All this is an effort—and so far, it has been a successful effort—to lower processing costs. The benefits of tantalum's complete immunity (not mere resistance) to most corrosive reagents are now obtainable at final operating costs far less than the costs of processing without tantalum.

Why not discuss your corrosion problem with Fansteel engineers for a practical, unbiased recommendation? There is no obligation, and consultations are kept in strictest confidence.

USE TANTALUM WITH ECONOMY for most acid solutions and corrosive gases or vapors, except HF, strong alkalis or substances containing free SO_3 .



Write for free book, *TANTALUM in Chemistry*

FANSTEEL METALLURGICAL CORPORATION
NORTH CHICAGO, ILLINOIS, U.S.A.

G561A

When inquiring check CP 4409 opposite last page

ENGINEERING

**Trouble-free operation
in moving solids
by pipeline . . .**

jet pump can be equipped to handle acids or alkalis

Uses: Transportation of solids through pipelines by utilizing liquid jet principle.

Features: Unit locates jet nozzle tip out of path of materials being handled assuring trouble free operation.

Description: Unit is installed with a water-tight housing with access door. Special gaskets are available to withstand effects of acids, alkalis, and high temperatures. Pump is factory assembled and has only three points of attachment. It is easily disassembled for maintenance. Sizes are available for 4, 6, 8, and 10" transport pipelines.

(A-S-H Hydro-Ejector pump is available from Allen-Sherman-Hoff Co., Dept. CP, 259 E. Lancaster Ave., Wynnewood Pa. . . or check CP 4410 opp. last page.)

**Surface roughness judged
in a side-by-side check
against a standard . . .**

comparator gives 10x magnification of illuminated surfaces

Uses: Judging surface roughness of mass-produced parts.

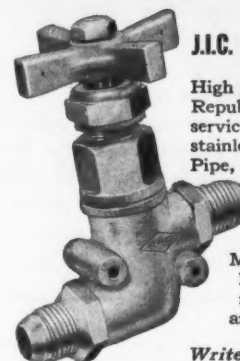
Features: Degree of roughness is judged in side-by-side comparison, through 10-power eye-piece, of illuminated sample and standard.

Description: Pocket-sized, hand-held instrument is self-illuminated with two pen-light batteries and a standard PR-4 flashlight lamp. Illumination and viewing of known standard and sample is achieved with a beam-splitting mirror. Standard comparison blocks are held by a spring-loaded clamp.

(Comparator is a product of Bausch and Lomb Optical Co., Dept. CP, 625 St. Paul St., Rochester, N.Y. Check CP 4411 opposite last page.)

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OFFSET GLOBE VALVE

J.I.C. AND AN STANDARD TUBE ENDS

High pressure needle and globe valves by Republic have forged bodies for super duty service—brass, steel, aluminum alloy, or stainless steel. Exclusive design features. Pipe, or AN or J.I.C. tube ends, or combinations, sizes $\frac{1}{8}$ " to 1". Operating range: needle—3,000 psi; globe—2,000 psi, -65° to 350°F.

Manufacturers also of high quality low and hy-pressure check valves, relief, 2, 3, and 4-way plug valves, and special valves to specifications.

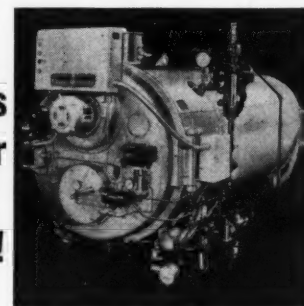
Write for complete catalog and name of nearest distributor.



RM
REPUBLIC MANUFACTURING CO.
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When inquiring check CP 4412 opposite last page

**PROTECTS this
BOILER better
than any
other finish!**



Sicon® SILICONE
HEAT RESISTANT FINISH

● SICON gray and SICON Maroon are used on all models of the "CB" line of packaged boilers, manufactured by Cleaver-Brooks, Milwaukee. SICON retains its color and gloss in the range of 500° F., far above the hottest skin temperatures of the boiler.

SICON is easy to apply—one sprayed on coat does the job. It dries fast, and protects the surface for the life of the unit. If your product generates sustained heat you need SICON, the finish that has stood the test of heat and time. Write today!

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Industrial Finishes Co.
WAUKEGAN, ILLINOIS

ENAMELS
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SYNTHETICS
VARNISHES

When inquiring check CP 4413 opposite last page

CHEMICAL PROCESSING

Dust Collection System*(Continued from page 171)*

blowers provide air for cleaning (one blower for each unit). The only moving parts in each blower are two rotors. Fixed volume of air is delivered at each revolution. Air is clean and dry. Blowers require no internal lubrication.

Results: In operation since June 1954, system is essentially 100 percent efficient. No visible quantity of dust escapes. Average dust collected by the system amounts to about 3030 lb per hr.

The very fact that made this a difficult problem for other collectors made it possible to use the dense wool filter. While heating pre-dried material produces a heavy dust load, it also results in a low moisture content in the gas stream that is favorable to fabric collectors. Dew point of the exit gas is about 100°F when gas temperature is about 180°F. This 80° difference makes it possible to operate the wool felt collector without fear of "mudding up" the fabric, despite frequent kiln shutdowns.

(Multiclone type 9VG10 and Dualaire type HR-4-W reverse-jet dust collectors are product of Western Precipitation Corporation, Dept. CP, 1000 West Ninth Street, Los Angeles 15, California . . . or for more information check CP 4414 on form opposite last page.)

(MD rotary positive blowers are product of Miehle-Dexter Supercharger, Division of Dexter Folder Company, Dept. CP, 100 Fourth Street, Racine, Wisconsin . . . or for more information check CP 4415 on form opposite last page.)



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- cut power costs
- save space
- increase production

with I-T-E MECHANICAL RECTIFIERS

For every unit of product obtained by electrolytic action, the I-T-E Mechanical Rectifier can reduce the amount of electric energy you have to buy.

The I-T-E Mechanical Rectifier normally operates at an overall efficiency of 96% to 97% or even higher. This efficiency can be translated into power savings totaling thousands of dollars annually. Or it can mean higher production for the same power cost.

Besides reducing power consumption, the I-T-E Mechanical Rectifier offers the advantages of small space-requirements and less costly installation. This means greater overall economy. The first user of I-T-E Mechanical Rectifiers has since ordered eight additional units and has specified still more for electrochemical plants now under construction.

Many improvements have been made since I-T-E first introduced the mechanical rectifier. For example, the unit can be restarted immediately after a shutdown caused by backfire—without changing the contacts. And contact life has been increased.

I-T-E Mechanical Rectifiers are available in single units—6000 through 12,000 amp and 24,000 amp from 50 to 250 volts d-c; 6000 amp and 12,000 amp from 250 to 400 volts d-c.

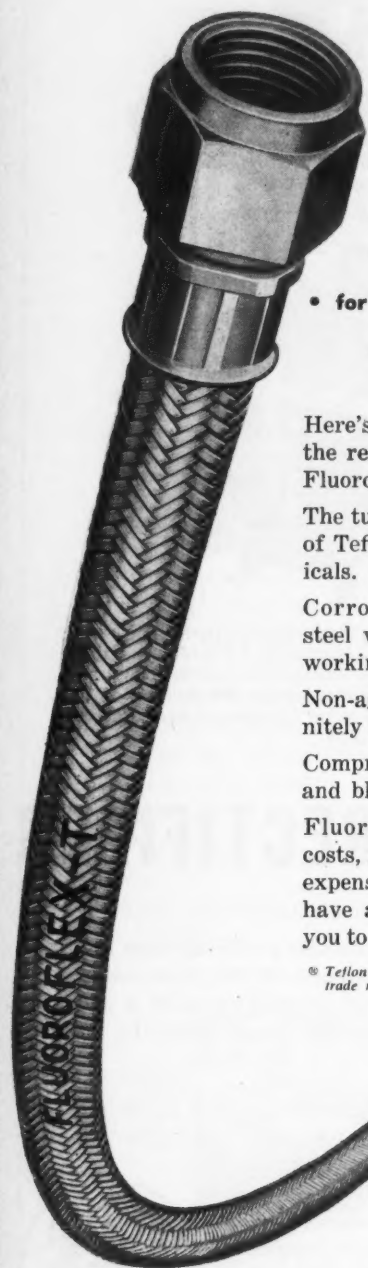
For additional information, write I-T-E Circuit Breaker Company, Transformer and Rectifier Division, 19th & Hamilton Streets, Philadelphia 30, Pa.



I-T-E CIRCUIT BREAKER COMPANY • Transformer and Rectifier Division

When inquiring check CP 4416 opposite last page

Finest flexible hose yet for corrosive conditions



**Resistoflex Teflon® hose
proves ideal...**

- for handling all corrosive fluids
- for hardworking steam and gas lines
- for temperatures to 500°F

Here's the original "flexible piping" with the remarkable properties of Teflon. It's Fluoroflex®-T R500 hose.

The tube, made from a special compound of Teflon, is completely inert to all chemicals.

Corrosion resistant SAE 304 stainless steel wire braid reinforces to 1000 psi working pressure.

Non-aging hose . . . stays flexible indefinitely from -100°F to +500°F.

Compression fittings . . . are leakproof and blow-off proof.

Fluoroflex®-T hose cuts replacement costs, reduces downtime and maintenance expenses, improves operations. If you have a tough hose problem, it will pay you to contact us. Send for Bulletin FH-2.

® Teflon is a DuPont trade mark. Fluoroflex is a Resistoflex trade mark.

IF IT'S NEWS IN
TEFLON HOSE — IT'S SURE TO BE
FLUOROFLEX-T

RESISTOFLEX

CORPORATION

ROSELAND, N. J. • WESTERN PLANT: BURBANK, CALIF.

When inquiring check CP 4417 opposite last page

ENGINEERING & MAINTENANCE

Tips on prescribed procedure for reconditioning plug valves . . .

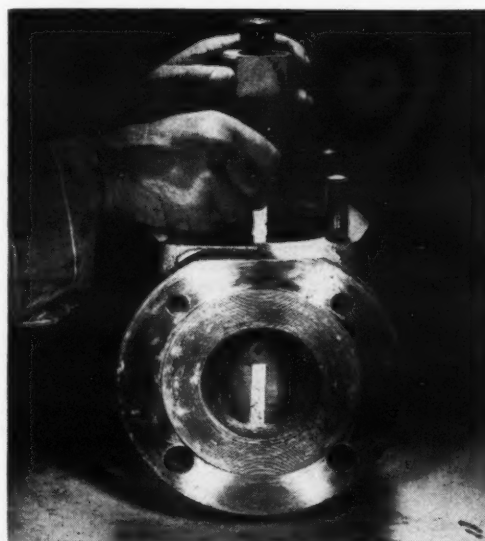
paper describes proper method for remachining, lapping plugs and bodies

Prescribed reconditioning for lubricated plug valves, as determined by extent of surface blemishes, is as follows:

1. If corrosion or scoring is very shallow: Salvage by relapping plug in body without machining seating surfaces of either body or plug.
2. Where corrosion, galling, or scoring is of moderate depth: Remachine tapered seating surface in body. Replacement plugs are furnished to standard oversize taper dimensions to match oversizing of taper bore.
3. For severe corrosion, erosion, galling and deep scoring: Rebuild worn areas in body by any approved process of welding or brazing.

Remachining valve bodies: An engine lathe or vertical boring mill, capable of producing a taper angle of $4\frac{1}{2}$ degrees from center line, can be used. Eccentricity of alignment of threaded plug stem hole with paper bore should not exceed 0.005". A trial cut can be taken to check correctness of setup and taper angle. Final cut must be taken lightly and should produce a clean, smooth, straight and round bore. After bore is machined lubricant grooves or ducts on body should be checked for proper depth.

Machining plugs to fit valves: Plugs are turned down to point where they will enter well into body seat, and taper checked with strips of feeler stock placed between plug and body. Additional allowance is left on taper of steel plugs, when



Checking taper of plug to remachined valve body with feeler stock

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For heavily abused areas:

IRVING Continuity Armouring

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Non-Sparking and Corrosion- Resistant ALUMINUM GRATING

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Perfect for Chemical Plants where fire is a hazard.

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Ask about

IRVING "GRIDSTEEL"

CONTOUR RETAINER MESH for Castable Ganister Linings used in refractionating units.

IRVING SUBWAY GRATING CO., INC.

ESTABLISHED 1902

OFFICES and PLANTS at
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1850 10th St., Oakland 20, California

When inquiring check CP 4418 opposite last page

CHEMICAL PROCESSING

turning down, to permit grinding after heat treatment. After hardening, steel plugs are ground and taper is matched as above. After taper is matched, plug is turned down until it enters body with plug shoulder below body gasket seat, a distance about equal to minimum allowed by manufacturer.

Lapping: Intimate fit between body and plug is produced by lapping of respective bearing surfaces with abrasive compound. Only lap enough to take out tool and grinding marks and produce a satin finish on taper surface. Lapping compound may



Applying lapping compound to surface of plug

consist of a 220-grit aluminum oxide, for steel, or 200-grit silicon carbide, for iron, suspended in a non-lubricating oil emulsion.

(Information obtained from paper, "Repair and Reconditioning of Lubricated Plug Valves", by T.H.M. Taylor, Chief Engineer, Nordstrom Valve Division, Rockwell Manufacturing Co., Dept. CP, 398 N. Lexington Ave., Pittsburgh 8, Pa.)

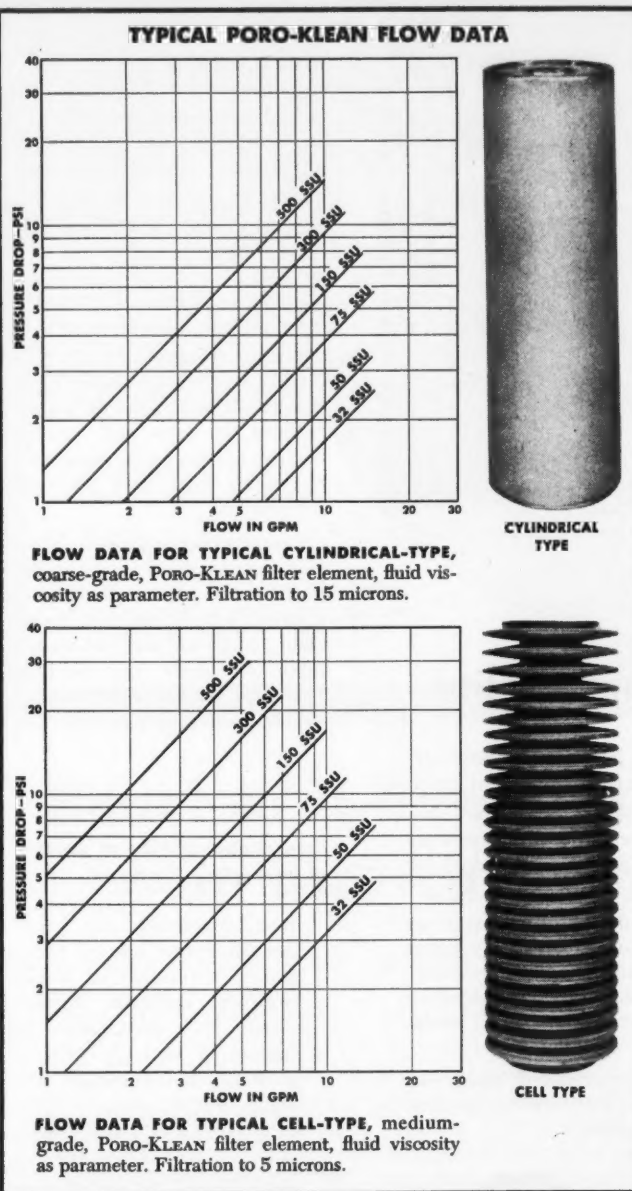
Engineered ceramics cataloged

Photographs liberally illustrate eight-page, two-color bulletin on engineered ceramics. Company's facilities, production methods, and quality control are shown. Full page chart lists properties of ceramic products. Special attention is given to metallized ceramic coatings.

Bul 955 is issued by Frenchtown Porcelain Co., Dept. CP, 101 Muirhead Ave., Frenchtown, N.J. Specify CP 4419 opposite last page.

DESIGN AND APPLICATION NOTES ON

Cuno's new Poro-Klean Filter



Precision 3-to-30 micron filter for high temperature and high pressure

PORO-KLEAN, Cuno's new porous stainless steel filter material, now offers the chemical, petrochemical, nuclear, and process industries true micronic filtration for temperatures to 900°F and differential pressures to 2000 psi.

Standard in 316 stainless steel, with low carbon content (0.03 to 0.05% max.), PORO-KLEAN is an ideal filter material for use in applications requiring corrosion resistance, high strength (ultimate tensile strength: 25,000 psi), high resistance to hydraulic shock, or positive freedom from fluid contamination.

Typical PORO-KLEAN applications, already in use in the chemical and process industries, are listed below. Approximate flow-rate curves for typical cell and cylindrical standard elements are shown at left (for exact data, see your Cuno representative).

TYPICAL PORO-KLEAN APPLICATIONS

TO REMOVE:

- Resin and airborne contamination from demineralized water
- Fixed-bed catalyst fines from petroleum products
- Over-cooked gels from polymers
- Radioactive contamination from light and heavy water
- Fine precoat particles downstream from primary filters
- Contamination and/or catalysts from high-temperature and high-pressure refinery gases
- Metal oxides from molten sodium, sodium-potassium, and bismuth
- Iron oxides from fuels
- Rust from steam
- Foreign matter from pharmaceuticals

TO RECOVER:

- Catalysts from gases and liquids

TO DISPERSE:

- Gases into liquids and other gases

If you have problems like these, let Cuno engineers help you apply PORO-KLEAN to their solution. See your Cuno representative, or write Cuno Engineering Corporation, 32-3 South Vine Street, Meriden, Conn. 5.20

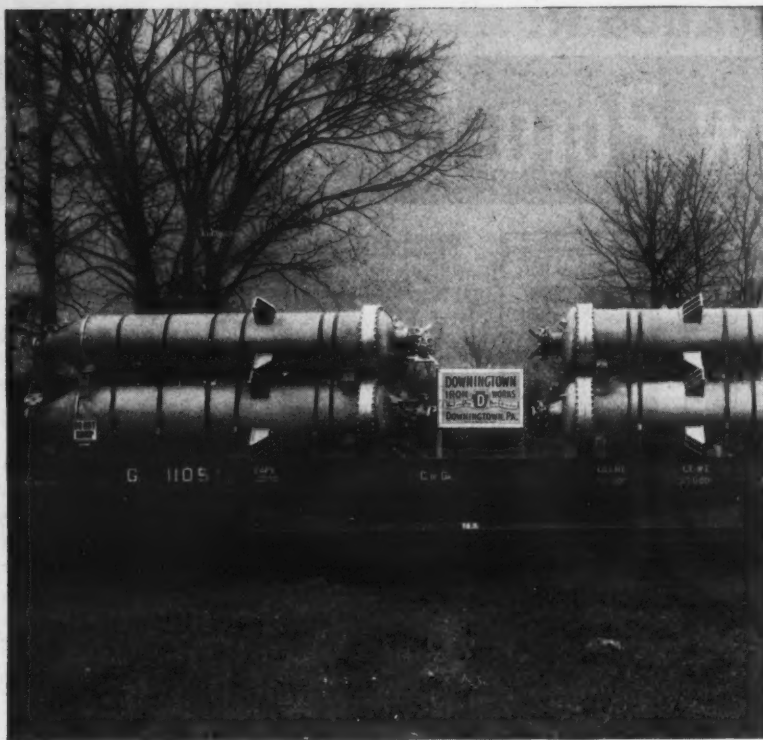


ENGINEERED FILTRATION

Removes More Sizes of Solids From More Kinds of Fluids

AUTO-KLEAN (edge type) • MICRO-KLEAN (fibre cartridge) • FLO-KLEAN (wire-wound) • PORO-KLEAN (porous stainless steel)

When inquiring check CP 4420 opposite last page



Another carload shipment of 8 process tanks, each 32" O.D. by 13'0" long, fabricated at Downingtown of stainless steel, type 304.

REPEAT ORDERS PROVE

Downingtown built means quality

These eight stainless steel process tanks form just one of many carload shipments ordered by one customer during the past several years.

Complete satisfaction with workmanship, price and delivery—that's why so many leading chemical, refinery and other process plants turn to Downingtown again and again with repeat orders for their complex plate fabrication work.

They know they can call on our experienced staff of engineers to help work out complex design and construction details. They know they can rely on Downingtown skill and experience for quality workmanship. They know Downingtown is thoroughly experienced in working and welding many alloys and clad materials, as well as the carbon steels and stainless steels.

Put your plate fabrication problems into experienced hands—at Downingtown Iron Works. Code work a specialty, and authorized insurance company inspection regularly available.

For further information, send for bulletin PF.

Downingtown Iron Works, Inc.

Downingtown, Pennsylvania

New York Office: 52 Vanderbilt Avenue, New York 17, N. Y.



HEAT EXCHANGERS • TOWERS • PRESSURE VESSELS • STORAGE TANKS • STEEL AND ALLOY PLATE FABRICATION
Division of: Pressed Steel Tank Company, Milwaukee 14, Wisconsin • Manufacturer of Hackney Products
CONTAINERS AND PRESSURE VESSELS FOR GASES, LIQUIDS AND SOLIDS

When inquiring check CP 4421 opposite last page

ENGINEERING

Tumbling barrel linings last longer when stud welded . . .

permits smooth inner surface free of projections

Surfaces remain uniform, without worn bolt heads, irregularities, or soft spots, when tumbling barrel linings are stud welded. Smooth inner surface lasts longer and plates are more easily replaced.

Barrel linings are subjected to constant jarring contact with heavy castings, being cleaned in a cascading bath of sharp cleaning stars and cleaning compound. They are $\frac{3}{4}$ " steel, secured to barrel by $\frac{3}{4}$ " diameter threaded studs end welded to backs. Studs project through holes in barrel and are fastened by nuts and grit-tight washers. Nuts are reached easily and studs cannot turn when nuts are removed.

(Threaded studs and stud welding gun are available from Nelson Stud Welding Div., Gregory Industries, Inc., Dept. CP, Lorain, Ohio . . . or for more information check CP 4422 on convenient Reader Service slip which is located opposite last page.)

Interchangeability of parts in pump line featured

Interchangeability of parts through entire line of process pumps is featured in 20-page, two-color bulletin. Cutaway views detail construction and features of vertically split, single-stage, and two-stage units.

Pumps described have capacities to 3200 gpm, heads to 925 ft, at temperatures to 800°F. Complete dimensions, typical installations, and modifications for special services are included.

Form 7094-B is available from Ingersoll-Rand Co., Dept. CP, 11 Broadway, New York 4, N. Y. When inquiring specify CP 4423 on convenient Reader Service slip which is located opposite last page.

NO MATTER WHAT YOUR LEAKING JOINT PROBLEMS ARE



Leak Lock clings in tough films that stretch rather than break.

IT MAY PAY YOU TO TRY LEAK LOCK LIKE OTHER MAINTENANCE MEN HAVE DONE

For 5 years, Leak Lock has been surprising skeptical people who didn't expect to find a "barrier" for an "impossible-to-hold" material. They were surprised at the broad scope of its capabilities.

Leak Lock is being ordered regularly by a well-diversified list of important concerns who regard it as a "find" for special uses.

Send for information and a sample. And here's a tip: Don't depend on a lab. test. Try it on the actual job, and then you will know.

Leak Lock

STEWART INDUSTRIES, INC.
(FORMERLY HIGHSIDE CHEMICALS CO.)
16 COLFAX AVENUE CLIFTON, N. J.

When inquiring check CP 4424 opposite last page

NO RODDING NECESSARY!



In the closed position the piston or ram extends up into the tank, preventing plugging of the outlet.

In the open position with piston fully retracted, there is no resistance to flow of materials drained from the tank.

Made in any cast metal to meet your requirements.

Designed for bolting to existing flanges. For special adaptations and for jacketed vessels, adaptor pads are available.

Full Specifications on Application

STRAHMAN VALVES, INC., 16 HUDSON STREET NEW YORK 13, U.S.A.

When inquiring check CP 4425 opposite last page

CHEMICAL PROCESSING

**Compact lubricator feeds
up to 25 bearing points
on small machines . . .**

automatic unit is designed for measured feeding of oil, at 30 psi

Uses: For centralized lubrication on small machines where minimum of installation space is available.

Features: Lubricator is compact, automatic, is powered by machinery it lubricates. It will lubricate a machine before machine is started. Measuring 2 x 3 x 4 1/4", lubricator feeds controlled amounts of oil to as many as 25 bearing points on a machine.

Description: Automatic lubricators have adjustable ratchet which is attached to a shaft from convenient drive on the machine. Drive is transmitted through a series of reduction gears to piston-type pump. Pump discharges oil at 30 psi into distribution system of 5/32" tubing. Oil is transmitted through branch lines to meter units at each bearing point, where oil is filtered and measured in exact amounts. Pump delivers 0.4 cc of oil per discharge. It is available with any of four different sets of steel hobbled reduction gears, providing reduction ratios ranging from 100:1 to 2 1/4 million:1.

Nylon cam roller is used on ratchet arm, and nylon drive ratchets and bearings are used inside ratchet hub. Main shaft bearing inside lubricator is of porous bronze. Pump contains a brass cylinder and steel piston. It has an inlet filter made of felt.

(Type NV automatic lubricator is a product of Bijur Lubricating Corp., Dept. CP, 151 W. Passaic St., Rochelle Park, N. Y. . . . or for more information check CP 4426 on form opposite last page.)

**Principles of immersion firing
in steam boilers treated**

Principles of immersion firing, as applied to company's line of steam boilers, are treated in colorful 12-page catalog. Included in discussion are graphs, charts, cutaway views of boiler construction, and pictorial representations of heat transfer cross sections. Dimensions for boilers ranging in size from 10 to 300 hp are given.

Cat 5206 is issued by Sellers Engineering Co., Dept. CP, 4876 N. Clark St., Chicago 40, Ill. Specify CP 4427 opposite last page.

Estimate surface temperature and heat loss for block-and-cement insulation with nomograph on page 200

**It might pay you to
look into Inco castings**

Write today for "Cast to Outlast."
This 16-page booklet shows how much can be done to improve equipment performance with Inco-Cast Monel nickel-copper alloy and seven other cast Inco Nickel Alloys.

Heart of a Dowell "chemical brush" —an Inco-cast Monel impeller

Here's the heart of a cleaning unit that pumps corrosives at high velocities through chemical equipment. The unit is made by Dowell Incorporated, of Tulsa.

Dowell engineers use this impeller of Inco-Cast Monel* nickel-copper alloy to pump cleaning solvents. Composed largely of hydrochloric acid, these solvents are pumped from special tank trucks, into plant piping and equipment, to dissolve troublesome scale and deposits.

To protect the pipe and equipment from this dilute hydrochloric, Dowell strictly controls temperatures and exposure time. And they use specific in-

hibitors to prevent corrosion.

But how would Dowell protect their pumps? The high velocities would throw off inhibitors and coatings.

After testing scores of materials, Dowell engineers decided on Inco-Cast impellers of Monel nickel-copper alloy. They selected this alloy because it resists attack by dilute hydrochloric acid. And by caustic solutions and compounds containing fluorine, which are sometimes added to dissolve silicate scale.

Stuffing box seals and shaft sleeves are also made of this corrosion-resisting nickel-copper alloy. Likewise, pins for acid tanks. And usually, the flange and nipple on field tanks are Monel nickel-copper alloy, too.

Whenever you are confronted with destructive service conditions, be sure to investigate the advantages Inco-Cast alloys can provide. One of these may be the answer to your difficulty.

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.



Castings . . . Sand, Centrifugal and Precision

When inquiring check CP 4428 opposite last page

HIGH VISCOSITIES?

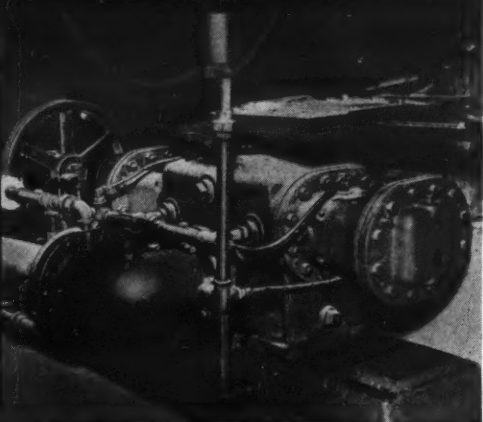
HIGH PRESSURES?

HIGH VOLUMES?

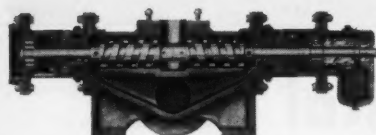
ABRASIVE MATERIALS?

This Sier-Bath Screw Pump is handling gum base with a viscosity of 300,000 SSU at 128°C., delivering 6 gpm. at 250 rpm. It is an external gear and bearing, steam jacketed, hopper type, operated by a 7½ hp. motor arranged with jack-shafts and pulleys. Two pumps have been operating for 8 years with minimum maintenance at L. A. Dreyfus Co., South Plainfield, N. J.

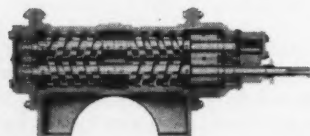
Solve your Heavy-Duty Pumping Problems with **Sier-Bath** **SCREW PUMPS**



Sier-Bath SCREW PUMPS



External Gear and Bearing Bracket Type for non-lubricating liquids and semi-liquids



Internal Gear and Bearing Type for lubricating liquids and semi-liquids

Sier-Bath ROTARY PUMPS



Screw Pumps

Gearex® Pumps

Hydrex® Pumps

50th Anniversary

Mfrs. of Precision Gears, Rotary Pumps, Flexible Gear Couplings

Member A.S.M.E.

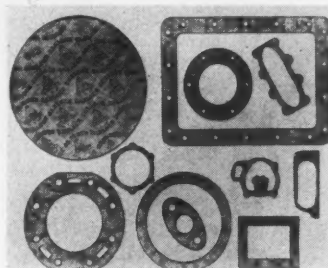
When inquiring check CP 4429 opposite last page

ENGINEERING

Latex binder impregnation upgrades gasketing for chemical use

Uses: Tight-sealing gasketing for oil and chemicals.

Features: Material has latex binder, withstands temperatures as high as 300°F, is not susceptible to changes in moisture content,



Cut gaskets are available in a variety of shapes and sizes

and is water- and oil-resistant. It has been approved by Underwriters' Laboratories for use where harmful liquids are encountered.

Description: Gasketing is a cork-base paper impregnated with Chemigum Latex supplied by Chemical Division of Goodyear Tire and Rubber Co. It is supplied in sheets or cut gaskets in thicknesses from 0.01 to 0.25".

Cut gaskets are available in a variety of shapes and sizes with outside dimensions up to 48".

(Garlock 662 is a product of Garlock Packing Co., Dept. CP, Palmyra, N.Y. Check CP 4430.)

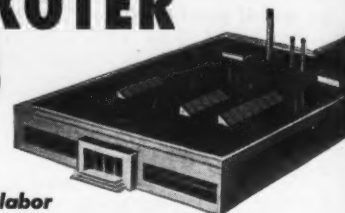
Extreme bearing pressure lubricants

Physical specifications and outstanding qualities of multi-purpose, extreme bearing pressure lubricants are given in two-page, two-color bulletin. Test results showing penetration, grease conditions, conditions of bearing, and changes in dropping point are presented.

Bul 101 is issued by Alpha Molykote Corp., Dept. CP, 65 Harvard Avenue, Stamford, Conn. Check CP 4431.

TROPICAL

COLD-PROCESS ROOFKOTER SAVES 50%



Use unskilled labor
Apply cold — no fire hazard
Extra years of life for leaky roofs!

From big automobile plants to small stores, Tropical Cold-Process Roofkoter is cutting roof reconditioning in HALF! Following our simple step-by-step method unskilled labor easily, quickly applies Roofkoter, to add extra years of weather-tight life to old roofs. Roofkoter stays "live", flexible; expands, contracts with temperature changes. Does not blister, crack or powder!

FREE! Send for free copy of "Saving Old Roofs"—save on repairs this year—write today!

TROPICAL PAINT COMPANY

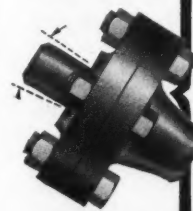
1128-1284 W. 70th, Cleveland 2, O.
HEAVY-DUTY MAINTENANCE PAINTS SINCE 1903
SUBSIDIARY OF PARKER RUST PROOF COMPANY

When inquiring check CP 4432 opposite last page

The Modern Way

to handle

- STRESS LOADS
- VIBRATION
- WIND SWAY
- THERMAL MOVEMENTS



—on TOWERS,
STACKS,
LARGE PIPING

Barco Flexible STRUT* Joints

* For Structural Applications

NOW you can design flexibility into structural supports in refineries the modern, efficient way with Barco Flexible Strut Joints. Typical uses are in flexible struts for supporting or bracing large catalyst lines, vent stacks on fluid catalytic crackers, guying tall vessels or columns. Where horizontal pipe lines require supports, two braces with Barco Flexible Strut Joints replace costly "A" frames. Strut joints are also used to direct and control thermal movements of high temperature piping.

The simple ball and socket design of the Barco Strut Joint insures flexibility in struts and guy rods without future maintenance. Just install them and forget them. These joints handle high load factors in compression or tension without the noise, wear and eventual failure of pin and clevis type braces.

Barco field engineers are always available. *Specifications and information on request.* BARCO MANUFACTURING CO. 537D Hough St., Barrington, Ill.

When inquiring check CP 4433 opposite last page

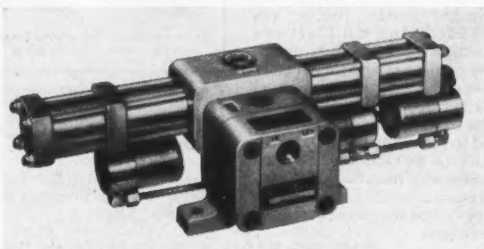
CHEMICAL PROCESSING

**Power operation to forward,
reverse and neutral given
on disc valve . . .**

remote control and automatic operation possible

Uses: Regulating flow of air, gas, oil, or water.

Features: Three-position power attachment, operated by air or gas, controls 4-way disc valve's action to forward, reverse, and neutral positions. It is designed for remote control and automatic operation.



Body and disc of 4-way disc valve are lapped to optical accuracy

Description: Unit utilizes rotating disc construction with molybdenum alloyed semi-steel body and chrome-plated inner surface. Integral disc and stem provide maximum rigidity and durability. Body and disc are lapped to optical accuracy.

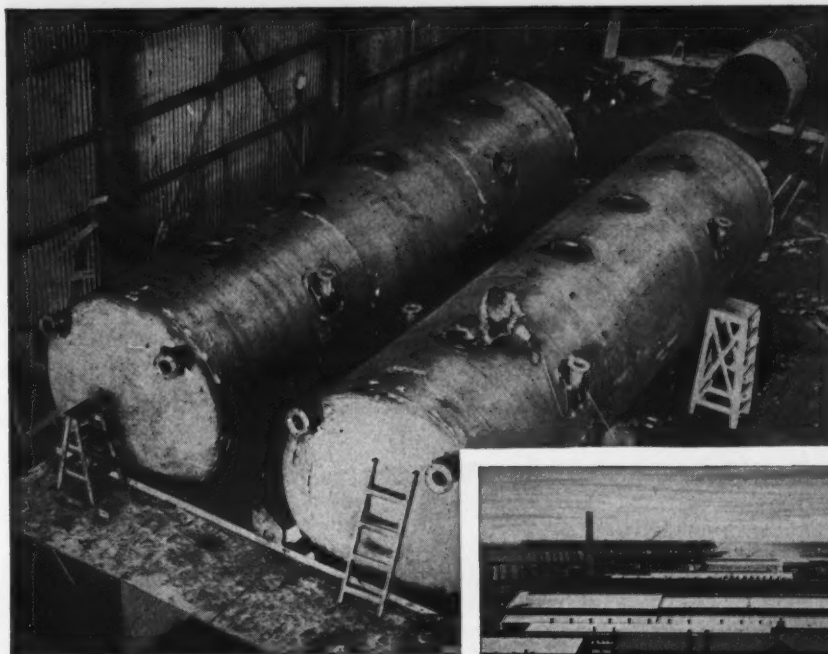
(Model PON power operated valve is a product of Ledeen Manufacturing Company, Dept. CP, 1600 S. San Pedro St., Los Angeles 15, California . . . or for more information reader may simply check CP 4434 on convenient Reader Service slip which is located opposite last page.)

Discusses use of redwood in tank construction

Use of redwood for tanks in the chemical industry is thoroughly discussed in 48-page, loose-leaf folder. Among items discussed are use of redwood tanks, lined and unlined, in handling hydrochloric acid, plating solutions, sulfuric acid, organic acids, bases, inorganic salts, and inorganic acids.

In each instance specific installations are noted, conditions of storage and use described, and results and length of service listed. A general discussion of redwood's suitability in various chemical industry applications is included together with suggested maintenance procedures for tanks and vats already in service.

"The Industrial Redwood File" is available from California Redwood Association, Dept. CP, 576 Sacramento St., San Francisco 11, California. When inquiring reader may simply specify CP 4435 on the convenient Reader Service slip which is located opposite last page.



A half mile of pressure vessels

These are two of seventy — over ½ mile — of 38½-foot vacuum tank casings built to meet the quality requirements of a well-known chemical maker.

The buyer also benefits from many savings made possible by Newport News extensive heavy fabrication equipment and the sixty years experience in using it.

Do you plan installations of heavy production equipment? You can command the services of Newport News for weldments of

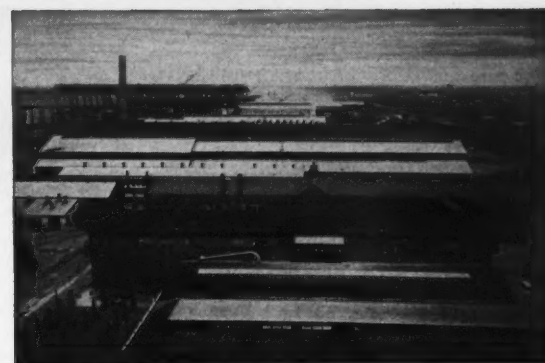
corrosion-resistant, alloy and clad metals in almost any size or shape, plus the required engineering background and complete welding and stress-relieving skills.

It will pay you to get the facts, shown in *Facilities and Products*. As you glance at its photos and brief captions, you'll see why Newport News can turn out — at low cost — specialized heavy equipment for chemical plants.

Send for *Facilities and Products* — free — today.

**Newport News
Shipbuilding and Dry Dock Company
Newport News, Virginia**

When inquiring check CP 4436 opposite last page



A Mile of Shops — Each shop is devoted to a special type of heavy production. Included are complete Machine Shops, casting, forging and other facilities which offer all of the advantages of the execution of the complete job.

N

ow — a new push-type internal Tube Cutter

A time-saving maintenance tool that may be used with your present air or electric motor to cut non-ferrous tubes.

E

asily carried. A must in every tool box.

Many uses in every plant. Action of cutting blades is produced by pushing cutter into the tube which automatically opens the double cutter blades.

W

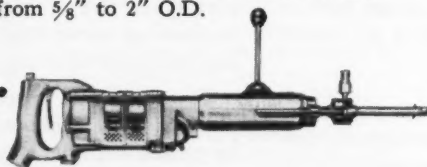
orks wonders when replacing tubes

Extremely useful. Saves time when replacing worn, small diameter tubes from $\frac{5}{8}$ " to 2" O.D.

Also furnished with motor and lever operator

An air-driven type internal tube cutter is available for production use. Cuts non-ferrous tubes 2-4 seconds each. Steel tubes 6-12 seconds each. Literature and complete details upon request.

BRANCH OFFICES: New York, Chicago, Philadelphia, Tulsa, Houston, Baton Rouge.
Representatives in principal cities of U.S.A., Canada, Mexico, England, South America and Japan.
EUROPEAN PLANT: Airetool Nederland, N.V., Vlaardingen, The Netherlands.



"There's an Airetool Tube Cleaner and Tube Expander for Every Type of Tubular Construction."



AIRETOOL

MANUFACTURING COMPANY

SPRINGFIELD, OHIO

When inquiring check CP 4437 opposite last page

ENGINEERING

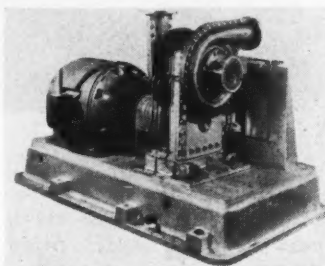
Pressures to 65 psi
and low flow rate
with compressor . . .

centrifugal unit furnishes air at 350 scfm

Uses: Providing compressed air for instrument systems or processes.

Features: Compressor will provide air at 65 psi at flow rates as low as 350 scfm. Two-stage centrifugal unit delivers oil-free air without additional equipment.

Description: Model is powered by 150 hp motor and is capable of flows to 750 scfm at 65 psi.



Two-stage centrifugal unit delivers oil-free air

Additional models are available to deliver from 750 to 2000 scfm at same or reduced discharge pressure.

(Centrifugal compressor is a product of Sawyer Bailey Corp., Dept. CP, 1559 Niagara St., Buffalo 13, N.Y. . . . or for more information check CP 4438 on form opposite last page.)

Lists solid and liquid
abrasive compositions

Five pages of tech data sheets describe manufacturer's buffing compounds which include cutting compounds for non-ferrous metals including alloys and castings; coloring compositions for final finish on all metals; and compounds for stainless steel and chromium.

Bul T-5 is issued by The Globe Compound Co., Inc., Dept. CP, Waterbury-Bristol Road, Waterbury 12, Conn. When inquiring specify CP 4439 on form opposite last page.

TRY DARCOVA PUMPCUPS

FOR

- Higher pump efficiency
- Lower pump maintenance

IT'S a fact that hundreds of reciprocating pump and cylinder users today are standardizing on Darcova Pumcups because they eliminate fluid slippage, costly down-time and maintenance!

It's easy to check these claims right in your own plant. Behind this exceptional Darcova Pumcup performance lies texture-engineering and cup design that conform precisely to pressure-temperature-fluid conditions.



Cross-section of the conventional and 45° bevel type Pumcups

Pumcups of various types are available in a complete range of sizes and texture-engineered compositions for your reciprocating pump and cylinder requirements.

Why not get all the facts? Send today for Pumcup Bulletin No. 5503.

DARLING VALVE & MANUFACTURING CO.
Williamsport 4, Pa.



TRADE MARK

Pumcups

When inquiring check CP 4440 opposite last page

Drive out
FOUL AIR
Blow in
FRESH AIR
with *Coppus Type A Ventilator*

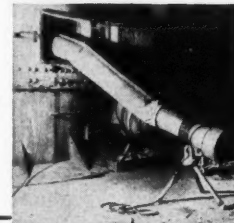
Assure greater safety, comfort for workers . . . get greater efficiency.

Drive out dangerous fumes, gases, stagnant or hot air from boilers, cable manholes, tanks, vats and other confined places. Supply fresh air continuously.

Send now for further information. Coppus Engineering Corporation, 383 Park Avenue, Worcester 2, Mass.

♦ **MANHOLES** made safe for workers' entrance within minutes.

♦ **BOILER AND TANK INTERIORS** cooled by Coppus. Fresh air supplied continuously.



ANOTHER
COPPUS
"BLUE RIBBON" PRODUCT

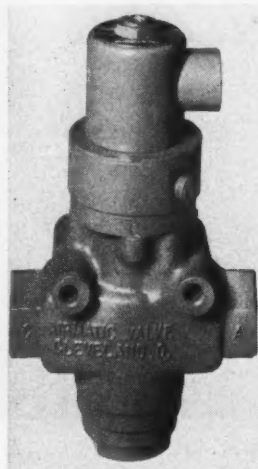
When inquiring check CP 4441 opposite last page

CHEMICAL PROCESSING

Positive, bubble-tight shut-off given by three-way solenoid pilot-operated air valve . . .

unit can handle 30 to 150 psi without springs, provides fail-safe performance

Uses: Air flow control on air clutches, air brakes, power feeds, and other pneumatic equipment.



Pilot-operated air valve can be operated either normally open or normally closed

Features: Valve offers a positive, bubble-tight shut-off without springs. Compact design combines simplicity and adaptability while permitting full pipe capacity at operating pressures ranging from 30 to 150 psi.

Description: Three-way solenoid pilot-operated unit has only two internal moving parts: spool and solenoid plunger. It operates continuously without harm to solenoid or valve. Solenoid coil operates on most AC and DC circuits with power consumption

of 10 watts maximum. Unit can be mounted in any position and operated normally open or normally closed. All internal parts are readily accessible.

(Pilot-operated air valve is a product of Airmatic Valve, Inc., Dept. CP, 7317 Associate Ave., Cleveland 9, Ohio . . . or for more more information check CP 4442 on form opposite last page.)

Applications of tubular products in process industry

Table listing chemical analysis, physical properties, mechanical properties, and creep strength of twenty steels, ranging from carbon steel through stainless steels, is featured in eight-page folder outlining applications of tubular products used in process industry. Brief descriptions of stainless and alloy tubing, stainless pipe, stainless sanitary tubing, heat exchanger and condenser tubing, boiler tubing, and mechanical tubing are also given.

Bul TB-408 is issued by The Babcock & Wilcox Company, Tubular Products Div., Dept. CP, 712 Eleventh St., Beaver Falls, Pa. When inquiring specify CP 4443 on form which is located opposite last page.

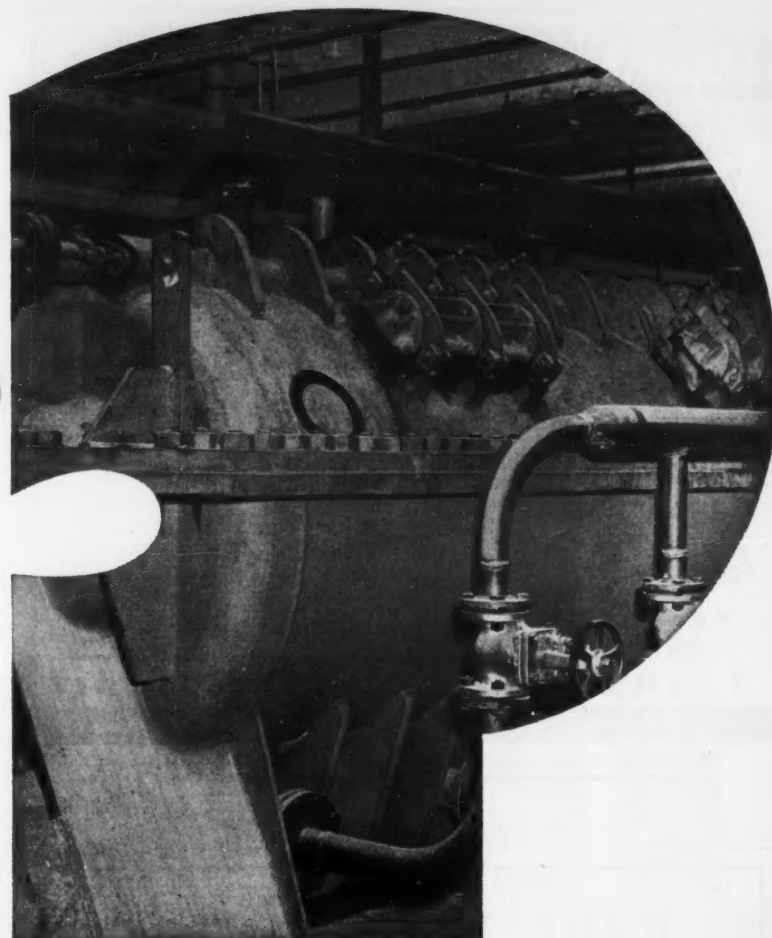


We'll GUARD your Confidential Process Problems...

while we help you solve them!

HERE'S A CASE where another big company had complete confidence in G-B . . . our ability to solve a tough problem, and keep it confidential.

The filter, in this particular process, was designed and engineered to filter salt from a dope-like material under very high pressure and temperature . . . complicated by the presence of a highly caustic solution. It has a filtering surface of 738 square feet, and will meet A.S.M.E. code requirements for pressures up to 150#. The filter uses a precoat . . . the cloth can be readily replaced by the customer. G-B filters of this type are available in all welded nickel and stainless steel construction . . . with solid or clad shell and solid filter element.



*If it's a
FILTERING OR
EVAPORATING PROBLEM
-and a tough one...
it will Pay you to
talk to G-B*

G-B engineers have a wealth of filtering and evaporating "KNOW-HOW" you can use. They will consult with you, without obligation, to help you solve your problems. They will help you run tests in your own plant . . . or you are welcome to use G-B's own complete testing facilities.



**GOSLIN - BIRMINGHAM
MANUFACTURING CO., INC.
BIRMINGHAM • ALABAMA**

When inquiring check CP 4444 opposite last page

Enclosed Horizontal Plate Filter

Leakproof
Vaporproof

•
for Batch or
Continuous
Operation

•
Cake stays in
place even when
run is inter-
rupted

•
Easy to clean

Write for
Catalog

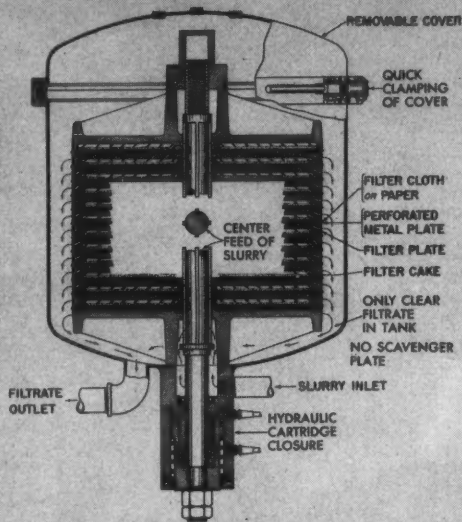
T. SHRIVER & COMPANY, Inc.

Filter Presses • Filter Media • Diaphragm Pumps

846 Hamilton St., Harrison, N. J.

Sales Representatives in
Decatur, Ga.—Houston, Tex.—St. Louis, Mo.
San Francisco—Montreal—Toronto

When inquiring check CP 4445 opposite last page



ENGINEERING

**Offer extra dependability
in submersible pump
for industry . . .**

unit's sealed motor breathes
with changing pressures

Uses: Units are suited to sump,
line booster, cooling tower, fire
protection, and barrel pumping
installations.

Features: Submersible pump de-
sign includes special features for
extra dependability
such as oversize
shaft, shaft seal de-
sign for submerged
service, motor with
larger oil reservoir.

A spring-loaded re-
siliant bag permits
sealed motor to
breathe with chang-
ing pressures and temperatures.

Description: Units are factory
assembled and ready for use with-
out venting, filling, adjustment, or
alignment. Standard models are
available from 5 to 150 hp, with
discharge head of 50 to 500', and
a 100- to 4000-gpm capacity.

(Verti-Line submersible booster
pumps are a product of Layne &
Bowler Pump Co., Dept. CP, 2943
Vail Ave., Los Angeles 22, Calif.
. . . or for more information check
CP 4447 on form which is located
opposite last page.)

Shows convertibility of control valve

A valve which converts from
pressure reducing and regulating
to back pressure control by
switching control lines is ex-
plained in four-page data bulle-
tin. Available materials, pres-
sure, and temperature ratings,
engineering drawing and details,
capacity, performance and con-
struction features on this Type
10 valve are given.

Bul 966 is issued by A.W. Cash
Co., Dept. CP, PO Box 551,
Decatur, Ill. When inquiring
check CP 4448 on the conven-
ient Reader Service slip which
is located opposite last page.

J. E. SIRRINE CO.
GREENVILLE • SOUTH CAROLINA

Engineers
ESTABLISHED 1902



PLANT DESIGN & SURVEYS • CHEMICAL • ELECTROCHEMICAL •
METALLURGICAL PRODUCTION • TRADE WASTE DISPOSAL •
WATER SUPPLY & TREATMENT • ANALYSES & REPORTS

When inquiring check CP 4449 opposite last page

Setting machinery?

use non-shrink

EMBECO GROUT
NOW READY-TO-USE



Whatever the grouting job—heavy equipment,
machinery, anchor bolts, building columns, etc.—
Embeco Pre-Mixed Grout will give you *lasting* results.

Embeco Pre-Mixed Grout produces a *flowable* grout
that is *non-shrink*. . . insures full bedplate contact . . .
maintains alignment . . . has high impact-resistance.



Send for free
Booklet

Creators and Manufacturers

of Products to Improve Concrete and Mortar

THE MASTER BUILDERS CO.

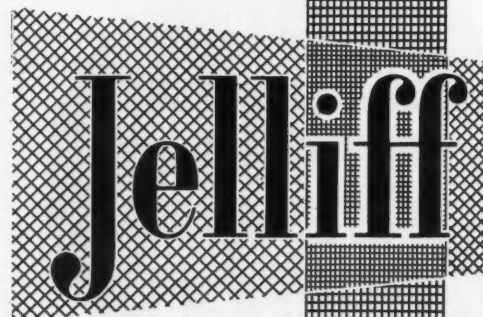
CLEVELAND 3, OHIO TORONTO 15, CANADA

When inquiring check CP 4450 opposite last page

CHEMICAL PROCESSING

WIRE MESH

Since
1880



Specializing in the non-ferrous metals
in counts to 200 x 200 or 50 x 750
and widths up to 48" in all commercial weaves



IN MESH WITH INDUSTRY

address your enquiries to Department 27

THE C. O. JELLIFF MFG. CORP.
SOUTHPORT • CONNECTICUT • USA



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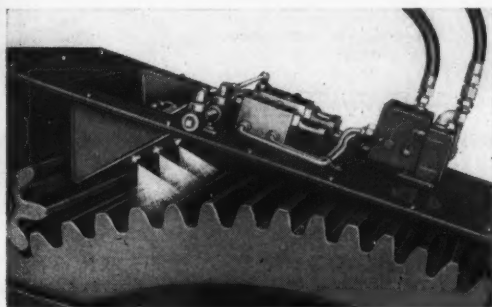
Lengthen gear and pinion life through uniform lubrication by spray valve panels . . .

units apply measured amounts of grease or oil directly to gear teeth

Uses: Spray lubrication of bull gears, girth gears, or any spur or herringbone gear trains.

Features: Spray valve panels apply lubricant directly to pressure side of gear teeth, at regular intervals, in measured amounts. Uniform lubrication provides longer life of gear trains, allows higher speed and heavier loads, and reduces amount of grease or oil consumed.

Description: Stainless steel spray valves, in panel, have built-in nozzles and are operated by air pressure. Air and lubricant are mixed to form a penetrating



Spray panel applies lubricant directly to pressure side of gear teeth

spray. Central pumping units deliver gear lubricant at regular intervals through a circuit of measuring valves which distribute it under pressure to spray valves. Self-contained panels measure approximately two feet by three feet and are fastened to gear housing or framework.

(Spray valve panels are a product of The Farval Corp., Dept. CP, 3249 E. 80th St., Cleveland 4, Ohio . . . for more information check CP 4451 on form opposite last page.)

Custom plastics service, how and why

Colorful folder describes engineering process for designing, printing, laminating, and fabricating flat and contoured plastic instruments, dials, calculators, and other products. Applications of these products to sales promotion, advertising, and production are outlined.

"Custom Plastics Service" is available from Allegheny Plastics, Inc., Dept. CP, Route 51 and Thorn Run Rd., Coraopolis, Pa. When inquiring specify CP 4452 on form opposite last page.

QUALITY and DEPENDABILITY Right Down The Line . . .



. . . Because WELDCO Pipe and Tubing Are Made With The Exclusive Double-Fusion Welding Process

You get quality, uniformity, dependability in every length of WELDCO Tubing, because WELDCO is produced by specialists . . . men who have the experience, equipment, and facilities to make Pipe and Tubing to your exact specifications.

WELDCO is available in Stainless Steel, Monel, Inconel, Nickel, Cupro-Nickel, and Hastelloy, in Tube and Pipe sizes from 3" to 30", Schedules 5, 10, and 40. For special problems, or regular applications, always specify WELDCO and be sure of getting top-quality, dependable products!

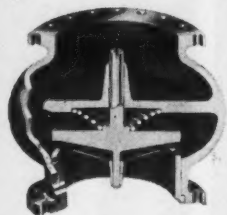
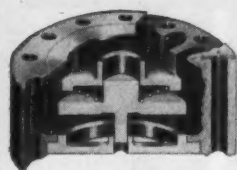
Whatever Your Needs In Tubing . . .
You're Way Ahead With WELDCO

THE YOUNGSTOWN WELDING & ENGINEERING CO., 3718 Oakwood Ave., Youngstown 9, O.

WELDCO

When inquiring check CP 4453 opposite last page

For all Piping systems handling . . .



**WATER
OIL
GAS
ACIDS
ALKALIES
and other
fluids**

WILLIAMS-HAGER
FLANGED

**Silent
CHECK VALVES**

Send coupon today for your copy of Bulletin 654! This bulletin gives complete details on these dependable Williams-Hager check valves and how they eliminate water hammer and other costly and annoying noises in all types of piping systems. Available in sizes for every service. Renewable working parts. Write today.



THE WILLIAMS GAUGE CO., INC.
146 Stanwix St., 2 Gateway Center
Pittsburgh 22, Pa.

Please send me a copy of Bulletin 654 on
Williams-Hager Flanged Silent Check Valves.

NAME _____
TITLE _____
COMPANY _____
ADDRESS _____
CITY _____ STATE _____
ZONE _____

THE WILLIAMS GAUGE CO., INC.

Our 70th Anniversary — 1886-1956

When inquiring check CP 4454
opposite last page

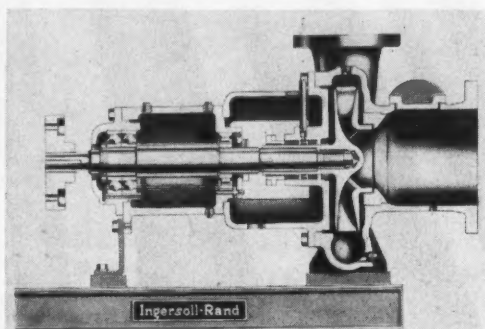
ENGINEERING & MAINTENANCE

**Handles liquids with high solids,
air, or gases without clogging
or vapor binding . . .**

centrifugal pump utilizes diverging impeller to
make it self-venting

Uses: Pumping of liquids containing high concentrations of solids, air, or gases.

Features: Centrifugal pump utilizes diverging impeller, which has greater area at discharge than at inlet, to handle successfully liquids containing



Centrifugal pump utilizes impeller with greater area at discharge than inlet

high concentrations of solids, air, or gases. Unit will not clog or become vapor bound since impeller makes it self-venting and self-regulating.

Description: Pump is horizontal, single-stage unit. It is available in sizes from 4 to 12", with capacities from 200 to 7000 gpm and heads from 5 to 225'. Unit will handle pulp and paper stock at concentrations as high as 10%, does not damage product.

(Paper stock and industrial liquids pump is a product of Ingersoll-Rand Co., Dept. CP, 11 Broadway, New York 4, NY. . . . or for more information check CP 4455 on form opposite last page.)

**No drip, no run before or during cure
with thixotropic, epoxy-based,
one-part adhesive . . .**

eliminates need for measuring, weighing, and
mixing separate components

Uses: Bonding metals to metals, to rigid plastics, or to other rigid materials.

Features: Thixotropic nature of adhesive results in an absence of drip or run either before or during cure. There is no need for specialized personnel to accurately measure, weigh, and mix two or more components since material is supplied as a one-part paste. No separate hardener is required.

MULTI-METAL Helps Solve Your Filtration Problems

Avail yourself of Multi-Metal's extensive research into flow rates, pressure drop and particle retentivity of various filter media. Call on Multi-Metal's vast experience, engineering, design and fabrication "know-how" in identifying the nature of your filtration problems, applying the right filter medium to the right equipment.

REMEMBER

Multi-Metal makes wire cloth and filter cloth in all meshes and metals; filter leaves and screens, discs, strainers, baskets, semi- and complete apparatus — to your exact requirements.



Leaves for horizontal pressure filter



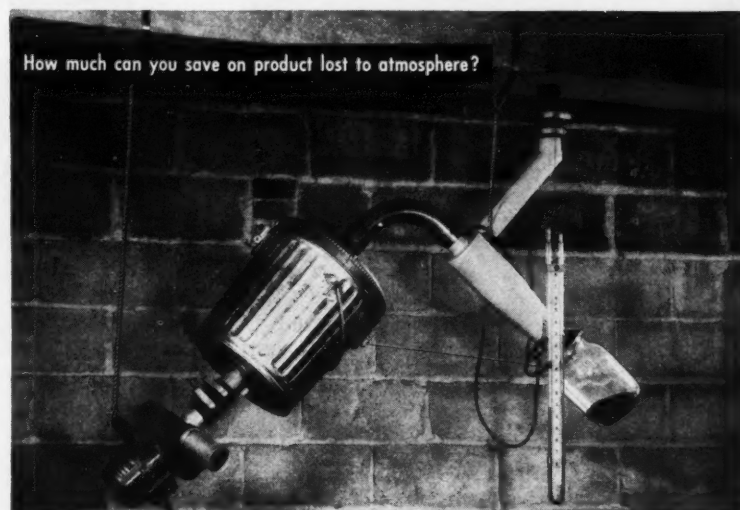
Large filter cylinder with Monel filter cloth

WRITE FOR CATALOG 50

MULTI-METAL WIRE CLOTH CO., INC.
1356 GARRISON AVENUE NEW YORK 59, N. Y.

When inquiring check CP 4456 opposite last page

How much can you save on product lost to atmosphere?



The PROOF is in this TEST!

Don't let valuable product go up your stack when you can bag it for profit! Need proof of this statement? Dustex can give it to you with the simple test equipment illustrated which gives accurate figures on efficiencies, hourly collection rate and stack losses, if any, to be expected after installation of Dustex Collectors. This test is run without shutdown or interference to production and gives you the facts as they apply to your individual operation. Used throughout the food and chemical industries for the dry collection of fines without filter media, Dustex Collectors are operating with efficiencies of 99.5%+ on a diversified list of products ranging from spray dried coffee to polyvinyl chloride. For proof on how you can bag more profit — request a copy of our Determination Test booklet.



BOX 2520 BUFFALO 25, N. Y.

When inquiring check CP 4457 opposite last page

CHEMICAL PROCESSING



Vertical or angular assemblies retain original position due to thixotropic nature of adhesive

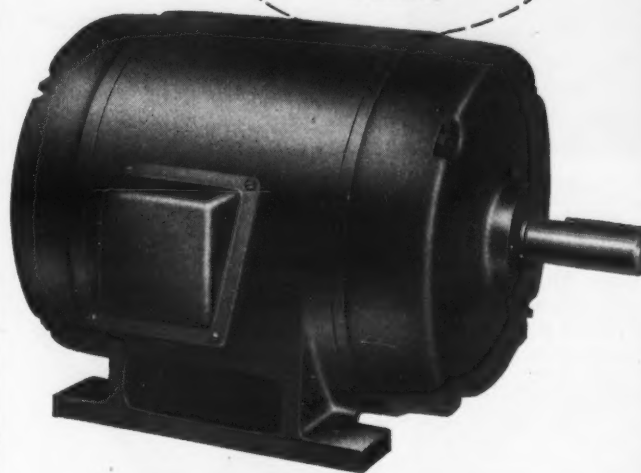
Description: Adhesive is based on Ciba's epoxy resin Araldite AN-100 and has a smooth buttery consistency suitable for spreading with brush or spatula. Glue line thickness remains the same after curing. Material may be applied in a vertical position and with part jugged at right angles or any acute angle. Finished bond retains assembly in exact position. Curing times range from approximately 7 minutes at 535°F to 1½ hours at 350°F.

(Bondmaster M620 is a product of Dept. P, Rubber and Asbestos Corp., Dept. CP, 225 Belleville Ave., Bloomfield, N.J. . . or for more information check CP 4458 on form opposite last page.)

Presents engineering data on industrial products

Product descriptions and essential engineering data for company's eleven lines of products for industry are given in 52-page products handbook. Material covered includes insulations and refractory products; transite asbestos-cement pipe; packings and gaskets; electrical products; Celite diatomite filter aids and mineral fillers; Celite diatomite catalyst carriers and metal Raschig rings; J-M synthetic silicates; friction materials; pipe protection materials; floorings; hand roofing and sidings.

"Products Handbook" is available from Johns-Manville, Dept. CP, 22 East 40th St., New York 16, N.Y. When inquiring specify CP 4459 on form opposite last page.



You get better performance with these Wagner DP Motors

Wagner DP motors are doubly protected by (1) rugged, corrosion-resistant cast iron frames, smoothly rounded so that no moisture can collect on them. Motor feet are cast as an integral part of the frame for maximum strength and rigidity. (2) Enclosures on the DP motor are completely drip-proof—virtually splashproof. Air intakes are located at the bottom of the endplates and air outlets are located at the base of the frame—one on each side.

Although engineered to meet the re-rated NEMA specifications which call for more power in smaller frames, the same high quality and long life performance that have made Wagner Motors "the choice of leaders in industry" for many years has of course been retained.

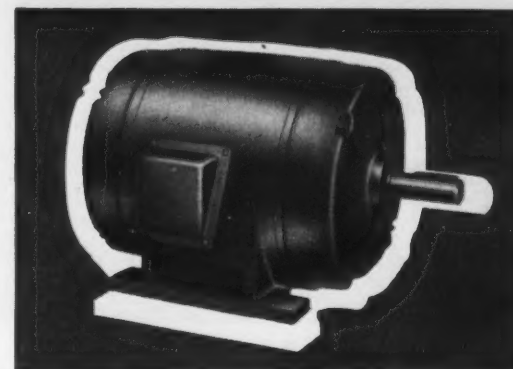
Full information and principal dimensions are given in Bulletin MU-202. Write for your copy today.



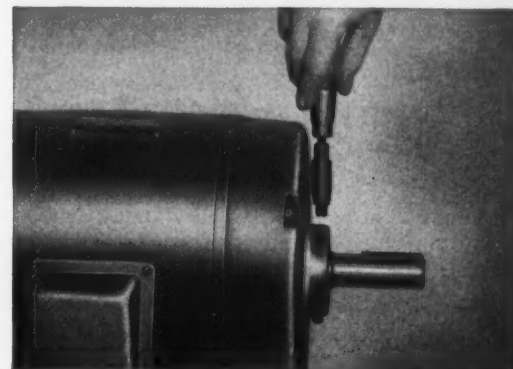
M56-4

ELECTRIC MOTORS • TRANSFORMERS • INDUSTRIAL BRAKES • AUTOMOTIVE BRAKE SYSTEMS-AIR AND HYDRAULIC

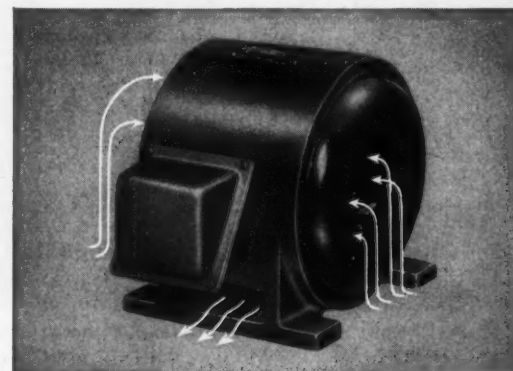
When inquiring check CP 4460 opposite last page



MORE POWER IN SMALLER FRAMES The Wagner DP Motor packs more power in a smaller frame and this smaller size means ease of handling and stocking . . . less space required for installation.



CAN BE RE-GREASED FOR LONGER LIFE This motor will operate for years without regreasing . . . bearings are completely enclosed . . . however, provisions have been made for adding lubricant and for the removal of old grease in cases where re-greasing is necessary.



COOL RUNNING Specially designed baffles direct cooling air from the blowers through the motor and provide protection for the stator windings. Blowers are an integral part of rotor . . . and move large volumes of air without noise or vibration.

Wagner Electric Corporation

6359 Plymouth Ave., St. Louis 14, Mo., U.S.A.

BRANCHES AND DISTRIBUTORS IN ALL PRINCIPAL CITIES

RADIUS UNLIMITED

with the **ALLPAX** Extension Gasket Cutter

There is no gasket too large to be cut with the Allpax Extension Gasket Cutter. With the simple addition of extra 6" extension arms, the radius can be increased as required. Without extensions this handy, versatile tool cuts diameters from 1/4" to 12".

Make replacement gaskets quickly and easily with the Allpax Extension Gasket Cutter and avoid costly delays in operation.

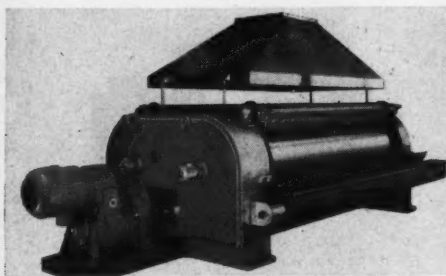
SEND FOR OUR NEW CATALOG TODAY!

See our complete line of packings, tools, and gasket materials. Contact our distributor or write to:

THE ALLPAX COMPANY
805 Mamaroneck Ave. • Mamaroneck, N. Y.

When inquiring check CP 4461 opposite last page

42" Diameter x 120" Long "DAVENPORT" ATMOSPHERIC Double Drum DRYER



Permits the continuous drying of many products from slurry stage into dried product.

The process of drying is accomplished by applying the liquid material in a thin film to the revolving, steam heated drums, on which the moisture is evaporated during a partial revolution. The dried material is removed from the drums by so-called doctor blades or knives.

Let our engineers consult with you on your Pressing, Drying, and Cooling problems. Send for complete Catalog C, or, for quick reference, consult your **CHEMICAL ENGINEERING CATALOG**.

davenport MACHINE and
DAVENPORT, IOWA U.S.A. FOUNDRY COMPANY

When inquiring check CP 4462 opposite last page

ENGINEERING

Fast positive closures possible at 1200 psi with valve . . .

design permits maximum flow for water, air, or gas

Uses: Control of flow of steam, hot water, air, or gases.

Features: Valve design permits fast positive openings and closures at up to 1200 psi at temperatures of 100°F.



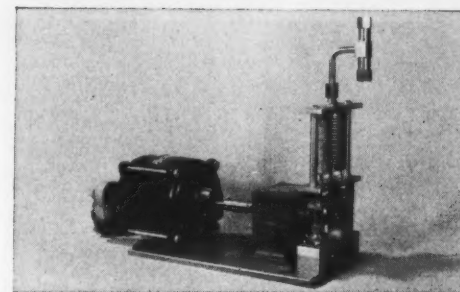
Valve is rated for service at 600 psi at 800°F and 1200 psi at 100°F

Description: Construction of unit assures maximum flow of materials. Valves are rated for service at 600 psi at 800°F and 1200 psi at 100°F. Material of construction is steel.

(Quick opening valve is a product of Klinger Corp. of America, Dept. CP, 95 River St., Hoboken, N.J. . . . or for more information check CP 4463 on form which is located opposite last page.)

Your guide . . . to more engineering and maintenance ideas and equipment is the alphabetical product directory beginning on page 213 in this issue

New! Explosion Proof Motor



in the Corson-Cerveny Micro-Bellows Pump

In this model of the Corson-Cerveny Micro-Bellows Pump, the motor is totally enclosed and sealed, in other words is explosion proof. (Underwriters' Laboratories approved.)

It has all the other features of the regular model Corson-Cerveny Micro-Bellows Pump plus a maximum working pressure of 500 lbs.

All parts of the Corson-Cerveny Micro-Bellows Pump in contact with the liquid being pumped are made of stainless steel and machined so that they fit together without packing, gasket material or any pipe compounds, preventing contamination of material being pumped. Write for complete information.

RESEARCH APPLIANCE COMPANY
143 Cemetery Lane • Pittsburgh 9, Pa.

When inquiring check CP 4464 opposite last page

FIRM-GRIP INDUSTRIAL GLOVES



AMERICA'S MOST POPULAR
HAND SAFETY GLOVES

- Permanent NON-SLIP on all 5 fingers and palm. Highly efficient embossed surface is integral part of glove.
- Curved FINGERS for comfort and easy use.
- Tough and Durable. Longer wear in every pair.

GENUINE
RUBBER LATEX
OR
NEOPRENE
LATEX

SEND for catalog and prices of complete Industrial Glove line.

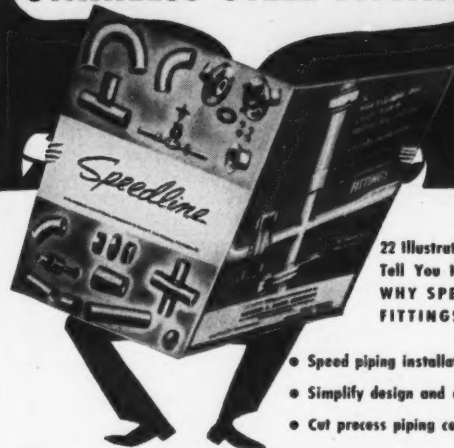
**SEIBERLING
LATEX PRODUCTS**

Division of Standard Industries, Inc.
NEW BREMEN, OHIO

When inquiring check CP 4465 opposite last page

CHEMICAL PROCESSING

LEARN ABOUT *Speedline* STAINLESS STEEL FITTINGS



22 Illustrated Pages
Tell You HOW and
WHY SPEEDLINE
FITTINGS

- Speed piping installation
- Simplify design and assembly
- Cut process piping costs!

Write for YOUR Speedline Fittings Catalog Today...
it's the Biggest News in Process Piping in Years!

©SPEEDLINE is a registered Horace T. Potts Co. trademark.

Distributors are located in principal cities from coast to coast

Speedline STAINLESS STEEL FITTINGS

manufactured by **HORACE T. POTTS COMPANY**
502 East Erie Avenue • Philadelphia 34, Pa.

When inquiring check CP 4466 opposite last page

NEW POCKET CALCULATOR For Liquid Batch Mixing

**CAPACI-DIAL for
PNEUMIX
AGITATORS**

Simply turn the pointer to the particular volume and consistency of your batch. The selector automatically tells the best size Pneumix Agitator to do your mixing.



The attached
coupon will
get you one
without
obligation.

ECLIPSE AIR BRUSH CO.
390 Park Ave. Newark 7, N.J.

Please send free CAPACI-DIAL to:

Name

Company

Address

Explosion-proof units can be
mounted on panel boards up to
1½" thick

Visible parts at panel front have
black instrument finish.

Fixtures are available in two styles.
Style 1 is factory sealed for use
with 1-3 125v pilot lights.

Style 2, requiring external seals,
permits any desired combination of
pilot lights, push-buttons, and se-
lector switches, or both.

Pilot lights, push-buttons, and ro-
tary selector switches are available.
Units are furnished with standard
push-button and selector switch
marking plates for mounting on
boards up to 1½" thick.

(Type EMP Condulets are sup-
plied by Crouse-Hinds Company,
Dept. CP, Syracuse 1, New York
... or for more information
about manufacturer's product
reader may simply check CP 4468
opposite last page.)

ENGINEERING

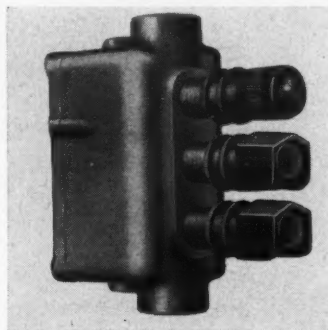
**Conserves panel space
in explosion-proof
installations...**

flush mounting units are dust-
tight, for pilot lights

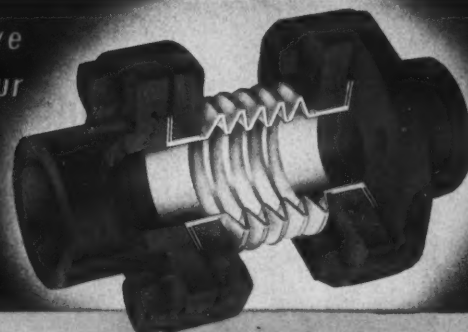
Uses: Mounting pilot lights,
push-buttons, or switch handles on
flow chart panels in explosion-
proof installations.

Features: Flush mounting con-
struction combines explosion-proof
service with minimum panel space
requirements. Units are constructed
so that they are dust-tight.

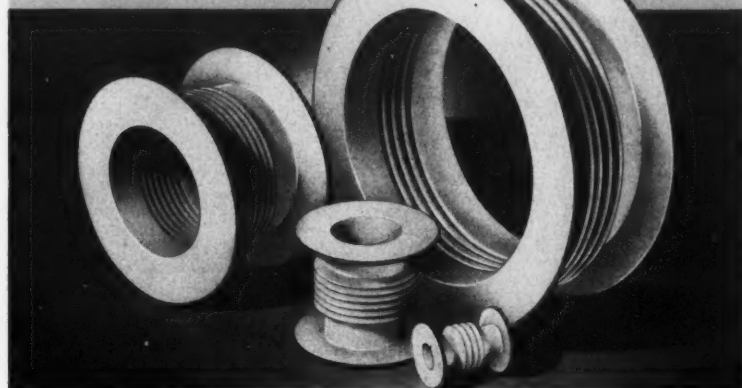
Description: Unit bodies, in
rear of panel, are fitted with 1"
through-feed conduit hubs and
large flat ground covers for access.



You can solve
many of your
difficult
piping
problems
with



JOHN CRANE
**CHEMICALLY INERT
BELLOWS** MADE OF TEFLON*



- 1 Chemically inert**
—will handle all corrosive
liquids, petroleum prod-
ucts, gases and solvents.
- 2 Life-long flexibility**
—will not damage or fa-
tigue under severe vibra-
tion or repeated expan-
sion and contraction.
- 3 Outstanding electro-
chemical properties**
—eliminate electrolysis in
the handling of chemicals,
acids, etc.
- 4 Wide temperature range**
—flex perfectly over a
wide temperature range.

"John Crane" Bellows are a positive answer
in the transmission of "hard-to-handle"
liquids and gases...including the most de-
structive corrosives...at temperatures from
-300°F. to +500°F. Typical applications
are vibration dampeners, expansion joints
and connectors for misaligned couplings.

Made from a special densely molded stock
and so machined that there is no inherent
stress of their free length —they expand and
contract with equal freedom of motion. End
flanges of French-type gasket construction
facilitate easy assembly and assure a leak-
proof seal. Available in a full range of stand-
ard pipe dimensions from ½ to 12 in.

Bellows are also available in a wide range
of designs for metering pumps, pressure ac-
cumulators, batching scale connectors, etc.

Further information on Teflon parts and products is
available in "John Crane's" 12-page illustrated catalog,
"The Best in Teflon." Send now for your free copy.
Crane Packing Company, 6421 Oakton St., Morton Grove,
Ill. (Chicago Suburb). In Canada: Crane Packing Co., Ltd., Hamilton,
Ont.

*DuPont trademark

JOHN CRANE **CRANE PACKING COMPANY**



When inquiring check CP 4469 opposite last page

When inquiring check CP 4467 opposite last page
MARCH 1956

what the **K** means to you



*...guaranteed
precision*

You're playing safe when you insist on pipe fittings that carry a "K"—you're assured of fittings built with care and precision.

Nothing is left to chance—close inspection every step of the way from pattern shop to shipping platform.

Study a "K". It's close grained, has walls of uniform thickness and good clean threads—the kind of a fitting that makes up easily and pulls up tight.

Get "K"'s from your supplier. Do yourself a real service.



THE KUHNS BROTHERS CO.

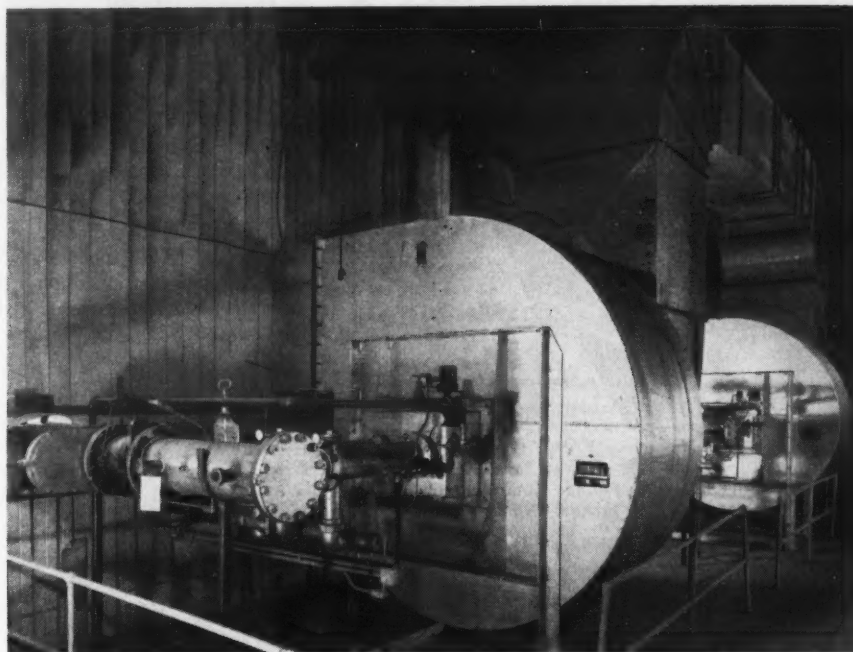
1800 McCall St. • DAYTON 1, OHIO

Established 1887

K

When inquiring check CP 4470 opposite last page

**engineering and
maintenance**



Neat compact direct gas-fired heaters are mounted adjacent to drying tunnel housing

Replacing steam coils with direct
gas-fired heaters permits Miami
Valley Coated Paper Co. to . . .

**cut overall drying cost
by \$20,000 per year**

**Uniform drying assures optimum printing surface on high
quality printing paper for graphic arts industry**

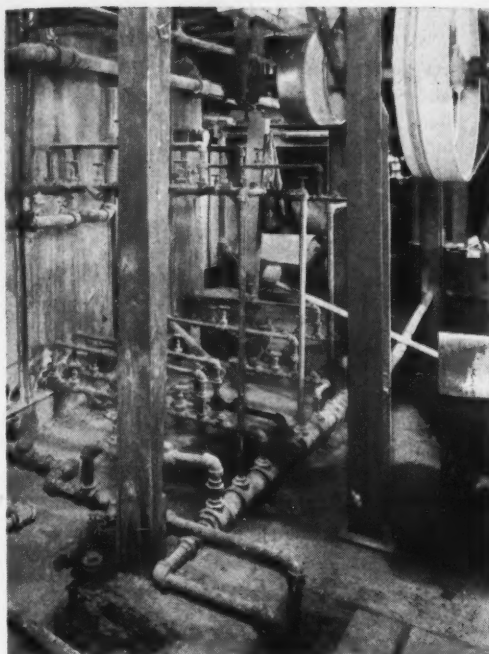
Problem: Steam coil system, used in drying coated paper at Miami Valley Coated Paper Co., Franklin, Ohio, was inflexible and inefficient in establishing and maintaining correct temperature to insure uniform drying over entire surface of paper. In addition it required a profusion of pipes and fittings, considerable floor space, and a large labor force to keep boilers running on a 24 hour a day basis.

Drying of coated printing papers is a

critical portion of manufacturing process used in preparing high quality paper for graphic arts industry. Only if drying is completely uniform will optimum printing surface be obtained. Coating process comprises application of a mixture of dyes in china clay, usually with a casein base, to surface of printing stock.

Method used for drying coating was by hot air from a steam coil heat exchanger, steam being supplied by a central steam plant. Areas between boilers and drying

CHEMICAL PROCESSING

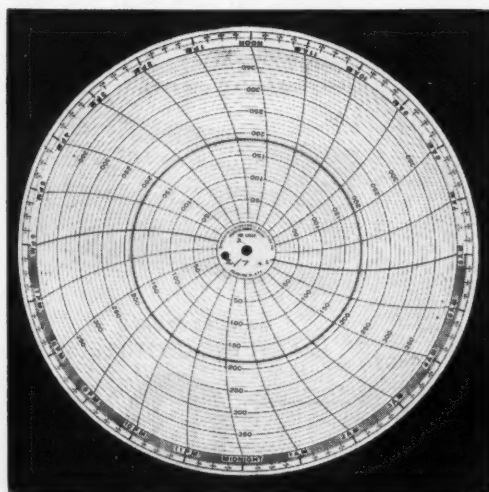


Profusion of pipes, valves, and connections necessary to control steam coil system

tunnels, in which steam lines were installed under floor, had to be adequately protected for foot traffic. Additional floor space was required for fuel and spare parts storage.

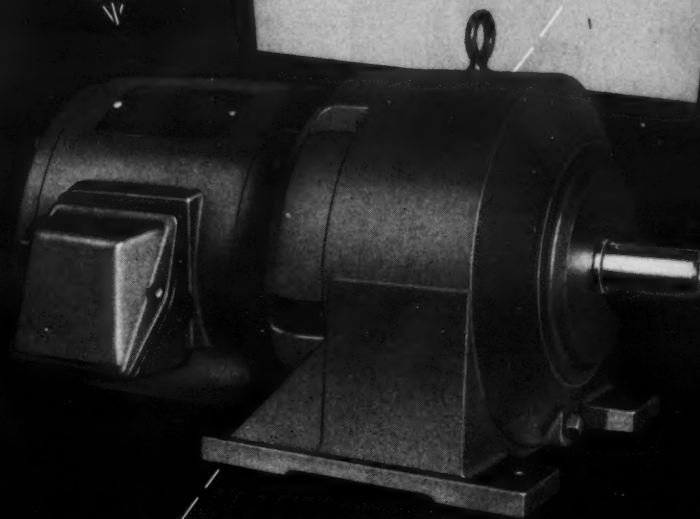
Solution: As part of a recent equipment and procedures modernization program, Miami Valley replaced steam drying system with three direct

(Please turn to next page)

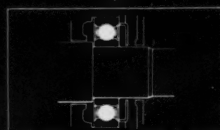


Uniform temperature control is evidenced by recording thermometer chart record

**Don't
overlook
what you
can't see**



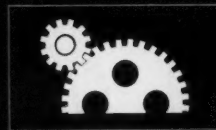
You can't always see what makes a gear-motor outstanding. It's the attention paid to small design details that makes the difference. Here are a few of the details that make the new Reliance Gearmotor stand above the rest.



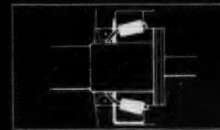
FOOLPROOF METERMATIC motor bearing lubrication and oil bath gear lubrication for long-life protection against wear.



INDUCTION HARDENING of the tough alloy steel gears gives a perfect combination of wear resistance and strength.



SIMPLIFIED GEARING with few moving parts reduces friction losses and lessens chances of breakdown.



THRUST BEARINGS handle heavy overhung loads safely by placing strain on the frame instead of the shafts.

Find out the complete story for yourself—contact your Reliance representative or write for Bulletin E-2408.

E-1009

**REDUCE
SPEED**

RELIANCE ELECTRIC AND
ENGINEERING CO.

CLEVELAND 10, OHIO • OFFICES IN PRINCIPAL CITIES

Canadian Division: Welland, Ontario

When inquiring check CP 4471 opposite last page

LEE

Corrosion-Resistant

PROCESSING EQUIPMENT

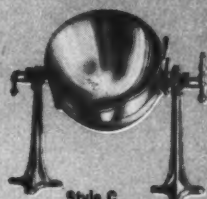
PRECISION BUILT OF STAINLESS STEEL
TO YOUR SPECIFIC REQUIREMENTS



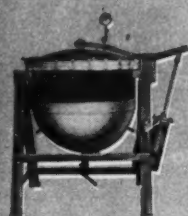
Style A
Two-thirds Jacketed
5 to 500 gal.



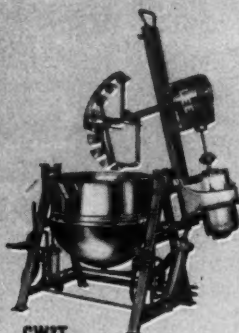
Style B
Full Jacketed
10 to 300 gal.



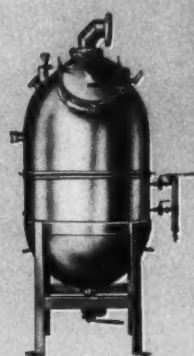
Style C
Two-thirds Jacketed
5 to 100 gal.



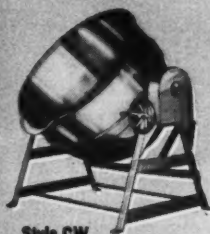
Pressure Kettle
Two-thirds Jacketed
40 to 200 gal.



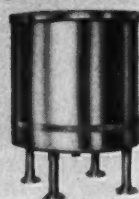
CWST
Center-line Scraper
Agitator Kettle—80 to 300 gal.



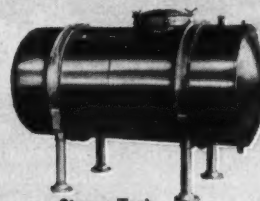
Vacuum Pan
50 to 500 gal.



Style CW
Two-thirds Jacketed
80 to 300 gal.



Pulp Tank
500 to 2,000 gal.



Storage Tank
100 to 5,000 gal.



Quick Cooling Pan
50 to 200 gal.

LEE

METAL PRODUCTS CO., INC.
418 PINE STREET, PHILIPSBURG, PA.

Designers and Manufacturers of
Corrosion-Resistant Processing Equipment
for over 25 years.

Technical bulletins
fully describing
these processing units
gladly sent on request.

ENGINEERING & MAINTENANCE

Gas-fired Heaters

(Continued from preceding page)

gas-fired air heaters. Units operate on low pressure natural gas and combustion air at one pound pressure, from air compressors. They are installed directly adjacent to battery of four drying tunnels and connected to them by common ducts crossing over and along bottom of tunnels. Tunnels are fed uniformly heated air through two separate recirculating systems.

Partitions changed as required

Battery of tunnels is housed in single unit 250' long and 45' wide. Individual tunnels are separated by removable partitions which can be changed as required by production demands. Three tunnels, served by two heaters supplying 125,000 cfm, are used for processing paper coated on one side and have only overhead headers that extend for 200' along each tunnel. Fourth tunnel, served by single heater at 60,000 cfm, has first forty feet equipped with an additional bank of floor level hot air inlets.

Air is fed to all tunnels at approximately 150°F. It is exhausted through floor level intakes and passed through common recirculation system where controlled amounts of outside air can be added if required. Control thermocouples are located a short distance downstream from burner and outlet of each air heater and can be adjusted within a fairly wide range as required by production.

Operation of air heaters is safeguarded by electric ignition and a constant burning pilot. Automatic units protect system against fire and explosion hazards through inadvertent utility failures.

\$20,000 yearly saving

Results: Manufacturer has realized a yearly saving in overall drying cost of \$20,000. Operation of drying process has been simplified. After startup, accomplished by merely pushing a button, no further attention is required. Temperatures are readily obtained and accurately maintained by a simple adjustment to control instruments. Complete, uniform drying is assured and flexibility of temperature adjustments has increased production.

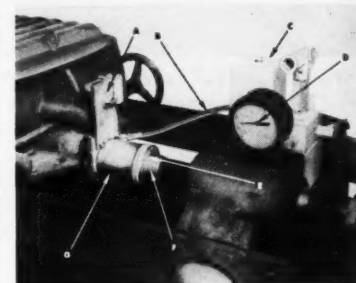
Compact installation has added considerable available floor space by allowing removal of two 250 hp boilers and eliminating fuel and spare parts storage.

(Direct gas-fired heaters are a product of Surface Combustion Corp., Dept. CP, Toledo 1, Ohio . . . or for more information about manufacturer's product reader may simply check CP 4473 on form opposite last page.)

HYDRO-LOCK

THE NEW HYDRAULIC FILTER PRESS CLOSER

Converts any manually operated filter press to hydraulic operation in less than one hour; enables repeated closing to a uniform pressure; no opening space in the press is sacrificed to accommodate the Hydro-Lock.



A-MOUNTING BRACKET
B-CONNECTING HOSE
C-PUMP
D-GAUGE
E-LOCK RING
F-PISTON
G-HYDRAULIC CYLINDER

Designed for long wear and safe "one-man" operation, the Hydro-Lock modernizes out-moded manually operated presses.

The NEW HYDRO-LOCK was received with marked enthusiasm at the recent Chemical Show. FREE TESTING SERVICE is available, please write for details.

MANUFACTURED BY
BIACH INDUSTRIES, INC.



10 INDIAN
SPRING ROAD

CRANFORD,
N. J.

When inquiring check CP 4474
opposite last page

CHEMICAL PROCESSING

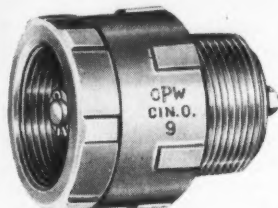
When inquiring check CP 4472 opposite last page

**Positive, no-leak action
provided by hose swivel
check valve . . .**

will not pull apart, prevents hose draining when flow is shut off

Uses: Provide performance features of an inlet check valve and a hose swivel in one unit.

Features: Unit is sealed with O-ring to provide efficient, no-leak operation. Lock wire prevents swivel tail and body from pulling apart and check valve prevents hose draining after shut off.



Hose swivel check valve is of bronze construction, has cork disc and tapered seats

Description: Coupling is constructed of wear-resistant bronze. It prevents twisting, kinking, and undesirable tension on hose resulting from rotary motion. Valve

has cork disc and tapered seats and poppet is spring-loaded approximately 1½ psi.

(No. 9 hose swivel check valve is a product of OPW Corporation, Dept. CP, 2735 Colerain Ave., Cincinnati 25, Ohio. Check CP 4475 opp. last page.)

**Liquids containing solids, gases
are pumped without clogging
or vapor binding . . .**

single-stage, centrifugal unit's diverging impeller maintains prime with any type of liquid

Uses: Pumping foamy solutions containing up to 50% entrained air or gases or viscous liquids or mixtures with exceptionally high solids content.

Features: Unit's design, a diverging impeller with few blades and correctly proportioned casing, prevents vapor binding, avoids clogging. Pump is self-venting and self-regulating and maintains its prime even when suction piping is uncovered or exposed to air.

Description: Single-stage, centrifugal units are available in capacities from 200 to 7000 gpm and heads from 5 to 225 ft. Deverging impeller has a much greater area at discharge than at inlet so that a vacuum space is formed between blades. Any entrained air or gas will enter vacuum space and pass through pump without vapor binding. Air space also prevents clogging.

(Centrifugal pump is a product of Ingersoll-Rand Co., Dept. CP, 11 Broadway, New York 4, N.Y. Check CP 4476 opposite last page.)

Can Fabric Filter a Solution of H_2SO_4 and HCl ?

Fabric may not be able to work miracles, but, as you know, many baffling problems can be solved with the right filter cloth, engineered to meet specific requirements.

For the dyestuffs industry, for instance, where a dye intermediate must be separated from a highly corrosive solution of sulphuric and hydrochloric acid, a Wellington Sears filter fabric of spun dynel was successfully developed to



withstand the chemical action. And in the soap industry, when operating temperatures may exceed 200° F., heat-resisting nylon fabrics are used.

But the job doesn't always go to the man-made fibers—specially constructed cotton filter fabrics have also proved to be the answer in many cases. Which only goes to show that it takes a special kind of knowledge and experience to help select or develop the filter fabric for each job.

You get both when you call on the filter cloth specialists who distribute Wellington Sears fabrics.

For names of distributors, and a free copy of "Filter Fabric Facts," write Dept. M-3.



Wellington Sears

A Subsidiary of West Point Manufacturing Company

FIRST In Fabrics For Industry

Wellington Sears Company,
65 Worth Street, New York 13, N. Y.

Offices in: Atlanta • Boston • Chicago • Dallas • Detroit • Los Angeles • Philadelphia • San Francisco • St. Louis

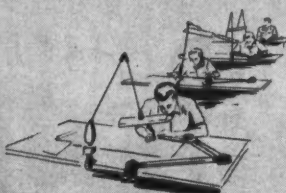
When inquiring check CP 4477 opposite last page

SPECIFY EIMCO FILTERS FOR MAXIMUM PERFORMANCE & PROFIT



Research and Development Center — a fully equipped pilot plant for research on solids-liquid separation through filtration.

Engineering — Designed with individual attention towards customer's requirements.



Facilities — includes foundries, fabrication and machine shops covering 26 acres.

Service — for the life of the machine, includes calls by trained personnel. Operational tips and consultation are part of the purchase price.



Eimco Vacuum and Pressure Filters are working in many industries increasing production at lower cost. These industries include: Metallurgical and Chemical Plants; Paint, Varnish and Pigment Plants; Sewage and Industrial Wastes; Pharmaceutical Laboratories; Foods; Coal; Petroleum; Tanneries; Pickle Liquors and Other Wastes; Beet and Cane Sugar; Paper; Steel Mills; Starch; Corn and Potato; Salts and Sand; Water Treatment and many others.

Selecting the unit for the solid-liquids separation problem in your plant is one of your most difficult decisions.

Testing samples under your own conditions, with the numerous variables of materials and equipment available today can be an endless research job.

Eimco's suggestion to companies with problems on solids-liquids separation is that they avail themselves of the data already gathered at Eimco's own Research and Development Center devoted to problems of this type.

Filters of all types are manufactured by Eimco and data on filterability of a product is available on each type of filter to which it is applicable.

Eimco engineers have this exclusive reservoir of experience, gained through more than half a century of service to the processing industries, and the facilities of Eimco's vast manufacturing plants where filters of standard or specialized design are built for each customer's requirements.

Eimco has gained the confidence of many of the world's top processing organizations through suggestions made to simplify flow sheet layouts, plant design or to cut operating costs. These contributions to the processing industry are made possible by new developments in filtration.

Eimco's engineers will be happy to consult with you regarding filtration problems. If further research or test work would seem to be indicated, Eimco equipment is available for test purposes in the customer's plant, on a rental or lease basis with funds thus expended applicable on production size equipment.

THE EIMCO CORPORATION
Salt Lake City, Utah—U.S.A. • Export Offices: Eimco Bldg., 52 South St., New York City

New York, N.Y. Chicago, Ill. San Francisco, Calif. El Paso, Tex. Birmingham, Ala. Duluth, Minn. Kalamazoo, Mich. Baltimore, Md. Pittsburgh, Pa. Seattle, Wash. Pasadena, Calif. Houston, Texas Vancouver, B.C. London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa



ENGINEERING & MAINTENANCE

**Readily formed plastic sheeting
can be cured merely by heat
and light pressure . . .**

material is especially adaptable for molding by matched metal or plastic die method

Uses: An engineering material designed for production of reinforced plastic parts and structural members.

Features: Material may be readily formed and then cured merely by heat and light pressure. No further chemical treatment is required. It is especially adaptable for matched metal or plastic die method of molding and can be processed by any standard molding technique.

Description: Sheetting consists of one or more layers of plastic integrally reinforced with linearly aligned, continuous glass filaments. Each sheet is roughly 60% glass and 40% plastic resin by weight. Two basic forms are currently available; unidirectional, in which all glass filaments are oriented to provide great strength in one direction; and isotropic, in which sheets are laminated together at 120° angles to give equal strength in all directions.

Material is supplied in two structural and one electrical grade in either roll or sheet form.

In its cured form material is essentially shatterproof, rotproof, mildewproof, and waterproof. It can be sawed, sheared, punched, drilled, sanded, painted, cemented, and polished.

(Scotchply reinforced plastic is a product of Scotchply Reinforced Plastic Div., Minnesota Mining and Manufacturing Co., Dept. CP, 900 Fauquier Ave., St. Paul 6, Minn. . . or for more information check CP 4479 on convenient Reader Service slip which is located opposite last page.)

**Efficiency of 99.23%
in removing dust
from city air . . .**

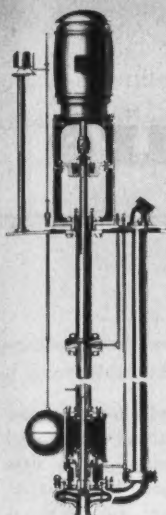
reduces content from 5.21 to 0.04 mgs per 1000 cubic feet of air

Uses: Providing dust free air for spectrographic, photographic, and optical laboratories, pharmaceutical, biological, and other manufacturing operations.

Features: Unit has provided a collection efficiency against fine atmospheric dust of 99.23% in one operating installation. Volume handled was 720,000 cfm of city air in which dust content was reduced from 5.21 to 0.04 mgs per 1000 cubic feet.

Description: Industrial air filter employs a tubular cloth filter charged with a filter aid which precoat filtering surfaces and provides an efficient matrix upon which fine particles are collected. One application of filter aid will last from two to three

When inquiring check CP 4478 opposite last page



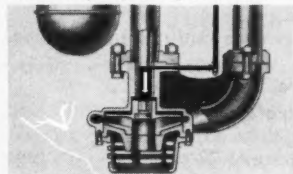
Yeomans
heavy duty
vertical
wet pit
pumps
...for chemical
plants
processing
industries
factories
utilities
power plants

YEOMANS PUMPS

are equipped with

LUBRI-VAC®

The lubrication system that reduces main bearing failures 90 to 95% . . . increases pump life up to 12 times



Here's how the exclusive LUBRI-VAC system works

The LUBRI-VAC® system consists of a specially designed impeller . . . and special lubricating lines leading to main bearing. Lubricant flows to both top and bottom of bearing (see solid black lines), and completely flushes the bearing surface. Impeller action also makes it impossible for abrasive material to work up into bearing.

Other Yeomans advantages:

Size of pump shafting . . . distance between intermediate guide bearings . . . size and location of thrust bearing.

... more than half a century of pump experience

YEOMANS

2003-S N. Ruby Street, Melrose Park, Ill.

... manufacturers of: centrifugal pumps • pneumatic sewage ejectors • distributors • clarifiers • mechanical aerators • digesters.

When inquiring check CP 4480 opposite last page

MARCH 1956



Industrial filtration unit has capacity of 1644 to 2740 cfm

years under normal conditions. Collected dust and filter aid fall into hoppers when unit is cleaned. Fresh filter aid is re-applied, by blowing it into operating collector.

(Ultra-filtration units are available from Wheelabrator Corp., Dept. CP, 1036 S. Byrkit St., Mishawaka, Ind. . . . or for more information check CP 4481 on form opposite last page.)

Handy wall chart gives data for valve selection

Wall chart provides tabular data on needle, bar stock, and toggle valves. Handy chart is 18 x 24" and includes a corrosion-resistance table and formula for proper valve sizing based on maximum flow desired.

"Valve Selection Chart" is issued by Hoke, Inc., Dept. CP, 145 S. Dean St., Englewood, N.J. When inquiring specify CP 4482 on form opposite last page.

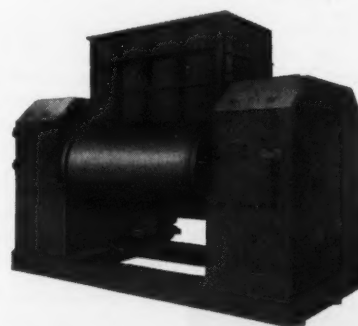
Full color cutaway of motor illustrates design features

Full-color, two-page cutaway views clearly illustrate important design features of company's series 100 motors in 16-page catalog. Totally-enclosed fan-cooled and open drip-proof styles are discussed.

Bul N-100-R is available from Howell Electric Motors Co., Dept. CP, Howell, Mich. When inquiring specify CP 4483 opposite last page.



READCO'S IMPROVED MIXER DESIGN
PROVIDES COMPLETE DISPERSION
IN LESS TIME...FOR LESS COST



READ STANDARD
CORPORATION

Bakery-Chemical Division
YORK, PENNSYLVANIA

It's Readco's unique split-level dispersion bowl that makes the difference. It provides a greater ratio of surface to the volume of mix. Overlapping sigma arm mixing action exposes new surfaces and breaks down the entire mass with each rotation, producing a homogenous mix in a short mixing cycle, eliminating peak loads. Closer clearances between mixer arms and shell prevent build-up of materials.

Readco Paper Coating Mixers can be supplied for manual or hydraulic discharge in 150, 350 and 750 gallon working capacities. Write for complete information.

When inquiring check CP 4484 opposite last page

"Another product safely shipped in Inland 'protection-eered'* Containers"



WELL-DRESSED FOR DIRTY WORK

Recently the DIVERSEY CORP. of Chicago introduced its new liquid detergent "TIG". But before "TIG" made its bow, there was a packaging problem that had to be solved from the inside out.

Diversey's chemists specified a steel pail with a lining that would prevent discoloration or contamination of this highly concentrated new detergent.

The sales department wanted a trim, convenient package with an attractive exterior, one that would register strong brand identification.

Inland took it from there. Our container "protec-

tioning" specialists developed a baked-on lining that tested out perfectly. Our design and lithography experts created a colorful exterior for the pail. "TIG" hit the market on schedule, all dressed up in the colorful new package as handsome as it is functional.

Now . . . ABOUT YOUR PRODUCT. Could the right container lining solve your problem of maintaining quality-in-transit? Would a more attractive container help increase sales? Chances are the steel packaging by Inland can give you just what you need. The full story is well worth your time. Write Bob Boecher, Dept. 314C.

*the right container, with the right lining for your product



INLAND STEEL CONTAINER COMPANY

Division of Inland Steel Company • 6532 South Menard Avenue • Chicago 38, Illinois • Plants: Chicago, Jersey City, New Orleans, Cleveland and Greenville, Ohio
Full line of steel and stainless steel shipping containers, including galvanized and heavy duty ICC drums.

When inquiring check CP 4485 opposite last page

new literature

Surface-active chemicals listed and described

Manufacturer's research and manufacturing activities in surface-active chemicals are illustrated by three-page, pocket-size folder. Over sixty chemicals are listed and described. Folder is divided into four parts: products for technical processing industries; products for drug, cosmetic, pharmaceutical fields; products for the agricultural chemical pesticide industries; and products for the food processing industries.

"Products List" is issued by Emulsol Chemical Corporation, a Div. of Witco Chemical Company, Dept. CP, 59 E. Madison St., Chicago 3, Ill. When inquiring specify CP 4486 on form opposite last page.

72 pages on where, why, how of gages and controls

Manufacturer's catalog of 72 pages describes gages and controls for heating, ventilating, refrigerating fields. Suggestions are given for measurement of combustion, draft, pressure, flow, vacuum, CO₂, smoke, static pressure, pressure differential, temperature. Conversion charts for combustion efficiency, air flow are included.

"Dwyer Controls and Gages" is issued by F. W. Dwyer Mfg. Co., Dept. CP, P. O. Box 373, Michigan City, Indiana. When inquiring specify CP 4487 on form opposite last page.

Details physical, chemical data on coating for metals

Physical and chemical data, in relation to application, is given in full page chart as part of four-page bulletin covering protective coating for metals. Visual presentation of application by spray or dip is included together with a listing of typical applications.

"Laqua" is issued by Fidelity Chemical Products Corp., Dept. CP, 470-474 Frelinghuysen Ave., Newark, N.J. When inquiring specify CP 4488 on form opposite last page.

Industrial bulletins pertinent to the reader . . . offering data on products, processes, service

Variables of dryer design and operation treated

Principal varieties of dryer design and effects of temperature and pressure on dryer size and operation are discussed in 40-page booklet. Detailed flow diagrams and elevation drawings clearly show operation of manufacturer's nine basic dryer styles. Charts and tables are related to desiccants, pressure drop, gas velocity, and temperature as applied to dryer operation.

Bul D-100 may be obtained from C. M. Kemp Mfg. Co., Dept. CP, 405 E. Oliver St., Baltimore 2, Md. When inquiring specify CP 4489 on form opposite last page.

Recommended engineering standards for multiple V-belt drives

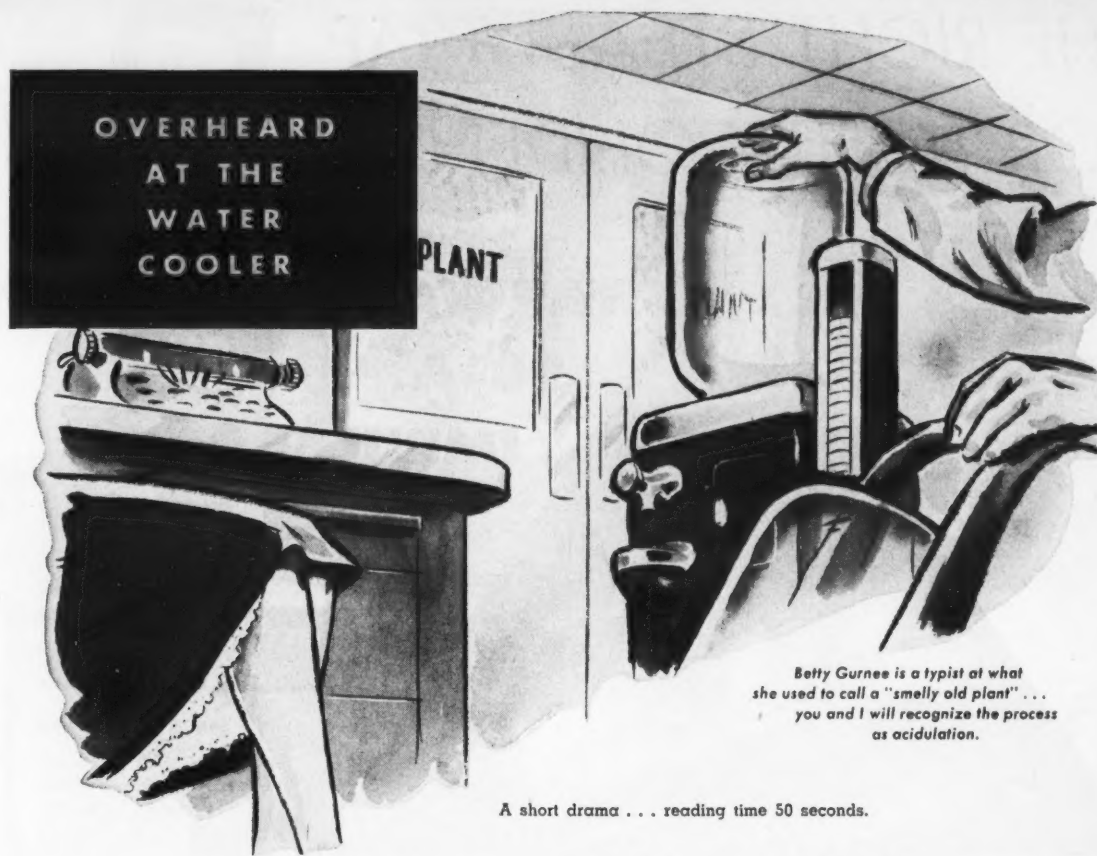
Revised 24-page manual gives recommended engineering standards for multiple V-belt drives. Basic changes from previous edition in 1951 are in hp ratings and basic hp formulas. Manual now shows ratings for belt speeds from 200 to 6000 fpm. Proper sheaves and belts for optimum efficiency and economy are indicated.

To obtain "Engineering Standards Multiple V-Belt Drives" submit \$1.00 direct to Rubber Manufacturers' Association, Inc., Dept. CP, 444 Madison Ave., New York 22, N.Y. or Multiple V-Belt Drive & Mechanical Power Transmission Assoc., Dept. CP, 27 E. Monroe St., Chicago 3, Ill.

Covers hydraulically-controlled marine loading arm

Photographs and information on how hydraulically-controlled marine loading arm can be used to advantage are given in 16-page bulletin. Marine and barge hose for this type of service is also described.

Bul on Marine Loading Arm is issued by Chiksan Co., Subsidiary of Food Machinery and Chemical Corp., Dept. CP, Brea, Calif. When inquiring specify CP 4490 on form which is located opposite last page.



A short drama . . . reading time 50 seconds.

He: "Got a bunch of camels around here now? I used to fill this bottle twice a week."

Betty: "Nobody, I repeat, *nobody* used to miss that water cooler on their way out of the plant. But, since we got the new doo-dad out there . . . why, it's almost like a bonus."

He: (*Exit, with bottle, muttering*)

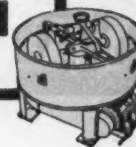
That "doo-dad" was a Simpson Mix-Muller. Betty's Boss had two reasons for buying it and only one had to do with personnel relations. He found that the Mix-Muller saved him the cost of ventilating one whole section of his plant. With it, he was able to control dust and noxious fumes from acidulation at the mixing source . . . because the Simpson Mix-Muller can be readily adapted for air exhaust or completely enclosed.

Control of dust and noxious or toxic fumes from dusty and dangerous processes is only one of the many adaptabilities of the Simpson Mix-Muller. It can be as easily adapted for heating, cooling or chemical reaction while mixing because it's designed and built to act as an integral part of a process. Some of these processes are described in our new "Handbook on Mulling". Write for your copy today and remember . . . mixing and the integration of mixing facilities is our business at National, it has been for over 40 years.



SIMPSON MIX-MULLER® DIVISION

NATIONAL ENGINEERING CO., 640 Machinery Hall Bldg., Chicago 6, Ill.



When inquiring check CP 4491 opposite last page

THE RIGHT STEAM TRAP FOR LIGHT CONDENSATE LOADS



YARWAY 20-A IMPULSE STEAM TRAP

● Successful companion to the standard Series 60 YARWAY Impulse Steam Trap, the 1/2" No. 20-A is right and recommended for *light load* applications in:

REFINERIES, CHEMICAL AND PROCESSING PLANTS on steam tracer lines, meter boxes, steam mains, separators, small dryers, pipe coils, small unit heaters, etc.

POWER PLANTS on headers, fuel oil preheaters, compressed air lines, small steam jacketed fire pumps, etc.

HOSPITALS, SCHOOLS, HOTELS AND INSTITUTIONS on autoclaves, sterilizers, steam tables, washers, small pressure cookers, steam mains, etc.

LAUNDRIES on small presses, puff irons, sock forms, drying cabinets, starch cookers, steam mains, etc.

The 20-A has all the YARWAY Impulse Trap features such as small size, stainless steel body and working parts, low cost, non-freezing—and immediate availability through 270 local Industrial Distributors.

Write for Bulletin T-1739-X.

YARNALL-WARING COMPANY
125 Mermaid Avenue, Philadelphia 18, Pa.

YARWAY **IMPULSE[®]**
STEAM TRAP

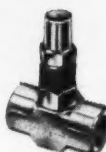
OVER 1,000,000 YARWAY IMPULSE STEAM TRAPS USED

There's a Yarway Impulse Trap
for every trapping need



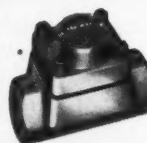
SERIES 60 AND 120

For all normal
trap require-
ments, pressures
to 400 and
600 psi.



1/2" No. 20-A

For light loads
on tracer lines,
steam mains,
small presses, etc.



SERIES 40

For heavy
loads requiring
extra high
capacity
steam traps.

INTEGRAL-STRAINER HIGH PRESSURE TRAP



For high
pressures,
high
temperatures.
(Flanged or
welding
connections.)

NEW LITERATURE

Discusses quick-opening doors for processing equipment

Quick opening doors for processing equipment are pictured and described in eight-page bulletin. Doors can be mounted on horizontal or vertical vessels and opened manually, semi-automatically, or with full automatic controls in approximately 45 seconds.

Bul SW-553 is issued by Special Equipment Div., Struthers Wells Corp., Dept. CP, Titusville, Pa. When inquiring specify CP 4493 on form opposite last page.

Straight-thread fittings for hydraulic service

Full dimensional information on straight-thread fittings with O-ring sealing is given in 20-page catalog. Included are machine dimensions and drawings for internal straight-thread boss, and listings of counter-boring and thread-tapping tools.

Cat 4301 is available from Tube & Hose Fittings Div. of Parker Appliance Co., Dept. CP, 17325 Euclid Ave., Cleveland 12, Ohio. When inquiring specify CP 4494 on form opposite last page.

Bulletin describes continuous liquid-solid separator

Continuous liquid-solid separator is discussed in illustrated four-page bulletin. Unit combines features of centrifuge and screen. Chart comparing separator with semi-continuous basket-type centrifuge is included.

Bul 1555 is issued by Merco Centrifugal Co., Dept. CP, 150 Green St., San Francisco, Calif. When inquiring specify CP 4495 on form opposite last page.

Gives information on properties of aluminum bronzes

Basic information on properties, composition, and function of aluminum-bronze alloys as furnished by company in castings, forgings, and machined parts is given in 32-page booklet. Complete engineering data on each grade of alloy are contained in 17-page section.

Booklet 15.100-1 is issued by W W Alloys, Inc., div. of Fansteel Metallurgical Corp., Dept. CP, 11666 Cloverdale Ave., Detroit 4, Mich. When inquiring specify CP 4496 on form opposite last page.

When inquiring check CP 4492 opposite last page

Reports on corrosion-resistant roofing material

Porcelain enameled corrugated sheet which is being widely used to combat corrosion of industrial roofing and building sidings is described in two-page bulletin. Bul on V-Corr is issued by Toledo Porcelain Enamel Products Co., div. of Bettinger Corp., Dept. CP, Toledo, Ohio. When inquiring specify CP 4497 on form opposite last page.



CHEMICALLY SPEAKING,
IT SURE DOES---

This bit of humor came to us from Stewart Fisher of South Bend, Indiana. Stewart works for U. S. Rubber.

WHY DON'T YOU SEND US A CARTOON?

We'll send you a \$10 check for every acceptable cartoon you send us . . . if it's in black ink, on 8 1/2 x 11" paper or board, ready to reproduce. The subject should be about some phase of the processing industries. If you can't draw too well, don't worry about it. Send us the cartoon idea . . . a description or rough sketch of the scene, with a caption . . . and we'll make you \$5 richer if we use it.

The address:

Cartoon Editor
CHEMICAL PROCESSING
111 East Delaware Place
Chicago 11, Illinois

Be sure to tell us your name, company, position, and address.

**SOME
RUN
IT
UP
AND
DOWN**



SOME RUN IT ROUND AND ROUND...

VERSATILE

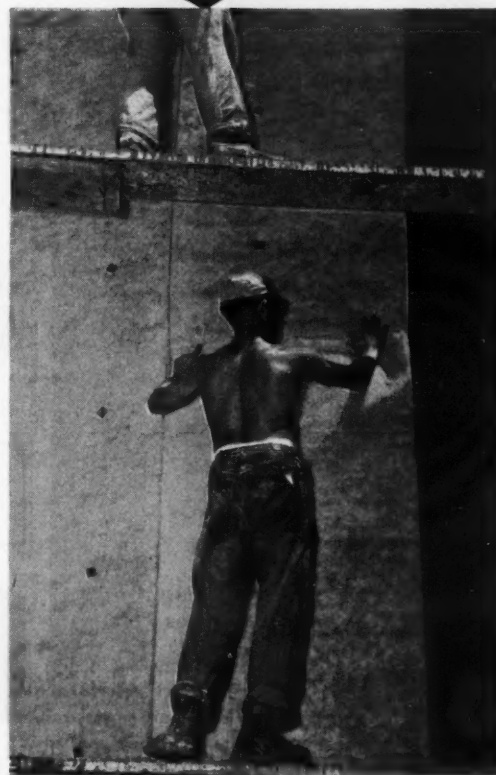
ULTRALITE

TANK INSULATION

Techniques of applying Ultralite vary, but everyone agrees that it is by far the fastest and cheapest way to insulate tanks, vats, vessels and other heated equipment.

With blanket rolls up to 10 feet wide, in no time at all you can cover any regular or irregular shaped vessel with this flexible glass fiber insulation. What's more, the vessel will be insulated "once and for all" — for Ultralite is a permanent insulation.

When you consider that labor is by far the big item in insulating, it makes sense to select the insulating material that lends itself to the fastest, easiest application. That material is Ultralite, the only insulation of long textile-type glass fibers. Write today for samples, prices, specifications and suggested application methods.



GUSTIN-BACON

Manufacturing Company

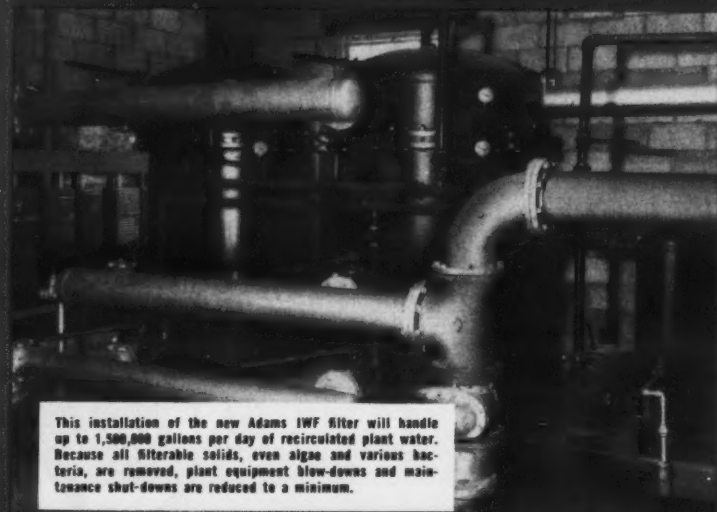


Thermal and acoustical glass fiber insulations • Pipe couplings and fittings • Molded glass fiber pipe insulation

254 W. 10th St., Kansas City, Mo.

When inquiring check CP 4498 opposite last page

A



This installation of the new Adams IWF filter will handle up to 1,500,000 gallons per day of recirculated plant water. Because all filterable solids, even algae and various bacteria, are removed, plant equipment blow-downs and maintenance shut-downs are reduced to a minimum.

the NEW ADAMS IWF Industrial Filter

For applications in:

- Process Water
- Boiler Feed
- Coolant Water
- Bearing Water
- Make-Up Water
- Potable Plant Water
- Secondary Recovery
- Waste Water Disposal
- Process Gases

Adams IWF filters are available in a wide range of sizes and multiple combinations. Cleaning is accomplished without disassembly by the unique Adams HI-FLOW backwash design.

The new IWF is only an addition to an extensive line of Adams filters. So, if you have any filtering problem, fill in the coupon below for further information and help.

R. P. ADAMS CO., INC.

243 East Park Drive • Buffalo 17, New York

In Our Twentieth Year of Service to Industry

R. P. ADAMS COMPANY, INC.
243 East Park Drive, Buffalo 17, N. Y.

We have a filtration problem. Please have your local representative call on us.

Name.....Title.....
Firm.....
Street.....
City.....State.....

When inquiring check CP 4499 opposite last page

NEW LITERATURE

Radiochemicals for research

What are they? How are they used? Answering these questions is the job of this 24-page 7 x 10" pamphlet. Besides the text, there are eight pages devoted to tables that list the available radiochemicals, give energy in MEV of the principal radiations, and list the deuterated compounds and C¹⁴-labeled compounds.

"Baker & Adamson Radiochemicals" is issued by General Chemical Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N. Y. When inquiring specify CP 4500 on form opposite last page.

Describes test unit for cement

One-page data sheet describes fineness tester for Portland cement by air permeability method. Unit conforms to ASTM C-204. Instrument described has been used to study fineness characteristics of pharmaceutical powders, other fine granular materials.

Bul 233 is issued by Precision Scientific Co., Dept. CP, 3737 W. Cortland St., Chicago 47, Ill. When inquiring specify CP 4501 on form which is located opposite last page.

How to bend tubing to exact tolerances

Complete instructions for bending tubing to exact tolerances using tube bender are given in four-page catalog. Photographs illustrate item's construction and operation.

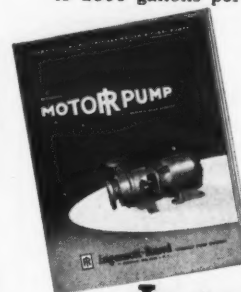
Cat 1141A12 is issued by Tube & Hose Fittings Div., The Parker Appliance Co., Dept. CP, 17325 Euclid Ave., Cleveland 12, Ohio. When inquiring specify CP 4502 on form opposite last page.

Are Your Pumps Dependable?

Dependability of your pumps may mean the difference between uninterrupted production and complete shutdown. You cannot afford shutdowns due to mechanical failure in your pumping system. Switch to Ingersoll-Rand MOTORPUMPS for more dependability.

MOTORPUMPS mount in any position and require no special foundation. Select the right units for your job from the most complete line of space-saving centrifugal pumps manufactured. Write for our new Bulletin on this line from 1/4 through 75 horsepower... capacities to 2800 gallons per minute... heads to 650 feet. Prompt shipment from either factory or branch stock.

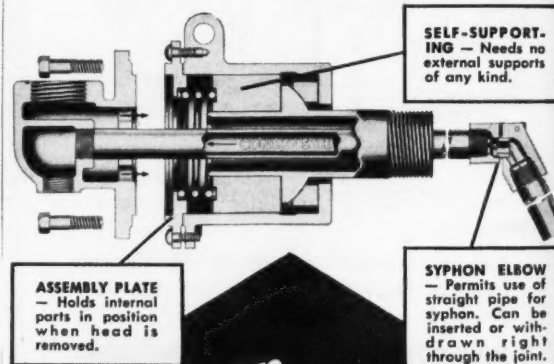
We can help you with any size pumping problem with units to 4000 horsepower.



Ingersoll-Rand

9-160 11 Broadway, New York 4, N. Y.

When inquiring check CP 4503 opposite last page



Johnson Rotary Joint with SYPHON ELBOW

Johnson Joints represent the best way industry has yet found to get steam or liquids into rotating rolls and cylinders. They are completely packless, need no lubrication or adjustment. The Type SBP shown gets steam in, condensate out, through the same head. Other types available for through flow service, in sizes to meet all operating needs.

WRITE FOR COMPLETE INFORMATION.

The Johnson Corporation

826 Wood St., Three Rivers, Mich.

When inquiring check CP 4504 opposite last page

CHEMICAL PROCESSING

Standard conversion tables for thermocouples

Booklet of 16 pages gives standard conversion tables for thermocouples. Temperatures are expressed on the International Temperature Scale of 1948. Electromotive force is expressed in absolute units. These tables incorporate recent changes in electrical units and temperature scale and differ slightly from previously published tables.

Bulletin F7255 is issued by Wheelco Instruments Div., Barber-Colman Co., Dept. CP, 1300 Rock St., Rockford, Ill. When inquiring specify CP 4505 on form opposite last page.

Facts about reverse-jet dust filters

Facts about reverse-jet dust filters are given in 20-page catalog. Included are schematic operating diagrams, performance curves for various types of dust, comparison chart of reverse-jet versus conventional-type filter performance, and air engineering data. List of over 70 users is included.

Bul 559 is issued by The Day Company, Dept. CP, 810 Third Ave., N.E., Minneapolis 13, Minn. Specify CP 4506 opposite last page.

Describes core ovens and cupola heating

Importance of uniformity, speed, accuracy, and control in drying of cores for castings is discussed on three pages of four-page illustrated folder. One page describes, and illustrates with photograph of installation model, a cupola heating system. Five photographs show typical installation of core drying ovens.

Bul 52 is issued by J. O. Ross Engineering Corp., Dept. CP, 444 Madison Ave., New York 22, N.Y. When inquiring specify CP 4507 on form opposite last page.

Specifications for process cast iron itemized in bulletin

Six classes of metallurgically controlled irons are covered in 20-page specification bulletin. Mechanical properties and tested applications are given in check list form. A discussion of pictured metallographical structures is included.

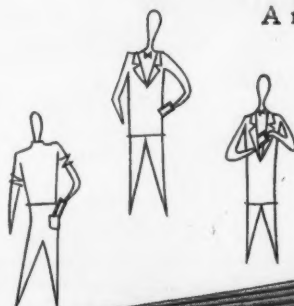
"Precision Cast Irons" is available from McNally Pittsburg Foundries, Inc., Dept. CP, Pittsburg, Kansas. Specify CP 4508 opposite last page.

P.S. it's pocket size !

If you've been looking for a *pocket size* catalog on *stainless steel* gate valves, you'll find the answer in this 4" by 7" booklet. Dimensions, diagrams and basic technical data are given in a simple and straightforward manner.

A natural for the pocket . . . the tool box . . . or the desk drawer.

Send today for your free copy of Catalog 55GP.



The Cooper Alloy stainless steel valve and fitting catalog represents the most complete and easy to use guide imaginable. If you haven't had the chance to review the many forms in which it is available, check with your local Cooper Alloy distributor or representative. Or drop us a line asking for the Catalog #55 Presentation Booklet.

Valve & Fitting Division



COOPER ALLOY
CORPORATION • HILLSIDE, N. J.

When inquiring check CP 4509 opposite last page



processing and engineering data

147a

Surface Temperature and Heat Loss for Block-and-cement Insulation

Data by BALDWIN-HILL COMPANY

Nomograph by BRUCE FADER, Associate Editor

Block mineral wool insulation and a white insulating finishing cement is becoming a more frequently specified thermal insulation combination. Development of this type of finishing cement which adds insulating value is comparatively recent. Data given here are helpful in predicting performance of the new combination and in establishing specifications for it.

Nomograph presented here is based on use of various thicknesses of block mineral wool insulation with $\frac{3}{8}$ -inch of finishing cement. It covers source temperatures as high as 1700°F (recommended limit for the block material) and outside temperatures to 220°F. This outer surface temperature is well above the value that would normally be specified.

Specifications are usually based on "maximum allowable surface temperature" or "surface heat loss not to exceed . . ." Starting from either of these results, nomograph will show thickness of mineral wool block insulation which, together with the cement coat, will be required.

Typical Example

What thickness of mineral wool insulation will be required in addition to $\frac{3}{8}$ -inch of insulating-finishing cement to insulate a preheated air duct with air at 660°F if permissible surface temperature is 120°F? What thickness for 130°F?

Connect hot surface temperature with desired outside temperature. Straight line between hot surface tem-

perature of 660°F and outer temperature of 120°F crosses mineral wool thick scale above three inches. Then about $3\frac{1}{2}$ inches of mineral wool would be required in addition to $\frac{3}{8}$ -inch of cement. Heat loss can be read directly as about 62 Btu/sq ft/hr.

If outer temperature of 130°F can be tolerated, $2\frac{1}{2}$ inches of mineral wool will suffice and heat loss will be about 75 Btu/sq ft/hr.

(Please turn to page 202)

Thermal Conductivity of Mineral Wool Insulation and Finishing Cement

Temp* °F	Thermal Conductivity	
	wool	cement
	(Btu, in/hr sq ft °F)	
75	0.623	
100	.640	0.33
200	.696	.36
300	.752	.39
400	.809	.42
500	.866	.465
600		.51
700		.565
800		.625
900		.69
1000		.755
1100		.825
1200		.90

*mean temperature for insulating material

If You Have a
CORROSION
Problem...

**Depend on GOODALL
and "RUBBERHIDE"
for the Right Answer!**

No matter what your corrosion problem may be, you can rely on Goodall engineering experience and technical skill to produce "Rubberhide" Linings in a specific compound that will provide the final solution. Compounded from rubber or neoprene to provide proper resistance to the specific corrosive agents involved, or to combat abrasive wear, these modern Linings will repay many times their cost through extended life of the products, parts or equipment to which they have been applied . . . from thumb screws to 20,000-gallon tanks.

"RUBBERHIDE" Linings are processed to objects shipped to our Linings Plants in Trenton, Chicago or Houston; or, when the objects are too large for such shipment, or the work involves fixed plant equipment, experienced field crews do the processing "on location". Whether factory or field processed, "RUBBERHIDE" Linings will assure effective, long-lasting protection.

Contact Our Nearest Branch for Details and Quotations



GOODALL RUBBER COMPANY

GENERAL OFFICES, MILLS and EXPORT DIVISION, TRENTON, N. J.
Branches: Philadelphia • New York • Boston • Pittsburgh • Indianapolis • Chicago • Detroit • St. Paul
Los Angeles • San Francisco • Seattle • Spokane • Portland • Salt Lake City • Denver
Minneapolis • Goodall Rubber Company of Canada, Ltd., Toronto • Distributors in Other Principal Cities

When inquiring check CP 4510 opposite last page

CHEMICAL PROCESSING

**Full page sectional view
details relief valve**

Full page of four-page, two-color folder is devoted to sectionalized view of bellows relief valve. Detailed information on pressure ratings of bellows, capacity data at various back pressures, sizes, and pressure-temperature limits are also included. Graph shows per cent rated capacity at varying back pressures for vapors and gases.

Cat 300-JB is issued by Crosby Steam Gage & Valve Company, Dept. CP, Wrentham, Mass. When inquiring specify CP 4511 opposite last page.

**Light-weight filter aid:
aluminum silicate**

Six-page, pocket-size folder explains how aluminum silicate filter aid's lighter bulk density permits it to be used on a basis of 20% less (by wt) than competitive materials in pharmaceutical and chemical operations.

"Sil Flo Filter Aid" is issued by Sil Flo Corp., Dept. CP, PO Box 7086, Fort Worth, Texas. When inquiring specify CP 4512 opposite last page.

**Advantages of using seamless
alloy tubing**

Advantages to be gained by utilizing seamless alloy mechanical tubing are covered in four-page folder. Ways to select the right tubing for a particular application are described.

Bul TB-360 is issued by Tubular Products Div., The Babcock & Wilcox Co., Dept. CP, Beaver Falls, Pa. Specify CP 4513 on form opp. last page.

For more information on product at right, specify CP 4514 . . . see information request blank opposite last page. ➡

EASY WAY TO PUT OUTPUT ON THE UPSWING!
shift lubrication methods from

Backward to Forward!



ALEMITE AIR-OPERATED TRANSFER PUMP

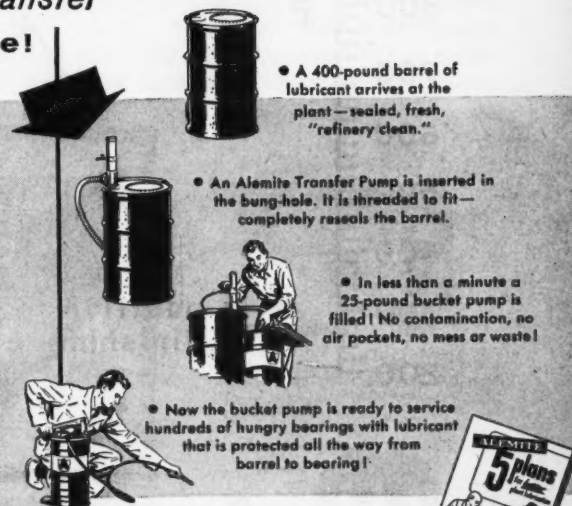
gives 63% faster lubricant transfer
... saves right down the line!

The real cost of plant lubrication is not just the lubricant alone! Actually, it's the time and labor needed to get the lubricant out of the original drum—into a bucket pump or powergun—and then applying it to machine bearings. That's where the real costs add up!

And that's why an Alemite Air-Operated Transfer Pump can cut costs in your plant—especially if you are using old-fashioned hand methods of lubrication. It transfers 37 pounds of pressure gun grease per minute—direct from the original drum—completely sealing the lubricant at all times—protecting against mess, waste and contamination.

It's fast—and versatile! It can even handle alcohol, cutting oils, kerosene—almost any non-corrosive non-abrasive fluid you use by the drum. Delivers light fluids at a rate of up to 15 gallons per minute!

There's no better way to speed up your handling of lubricants—because an Alemite Transfer Pump pays for itself by saving man-hours and machine-hours as well!



FREE! New Booklet:
"5 Plans for Better Lubrication"
Alemite, Dept. D-36, 1850 Diversey Pkwy.
Chicago 14, Illinois

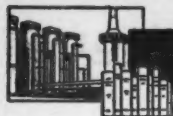
Please send me my FREE copy of "5 Plans for Better Lubrication."

Name.....
Company.....
Address.....
City..... Zone..... State.....

ALEMITE

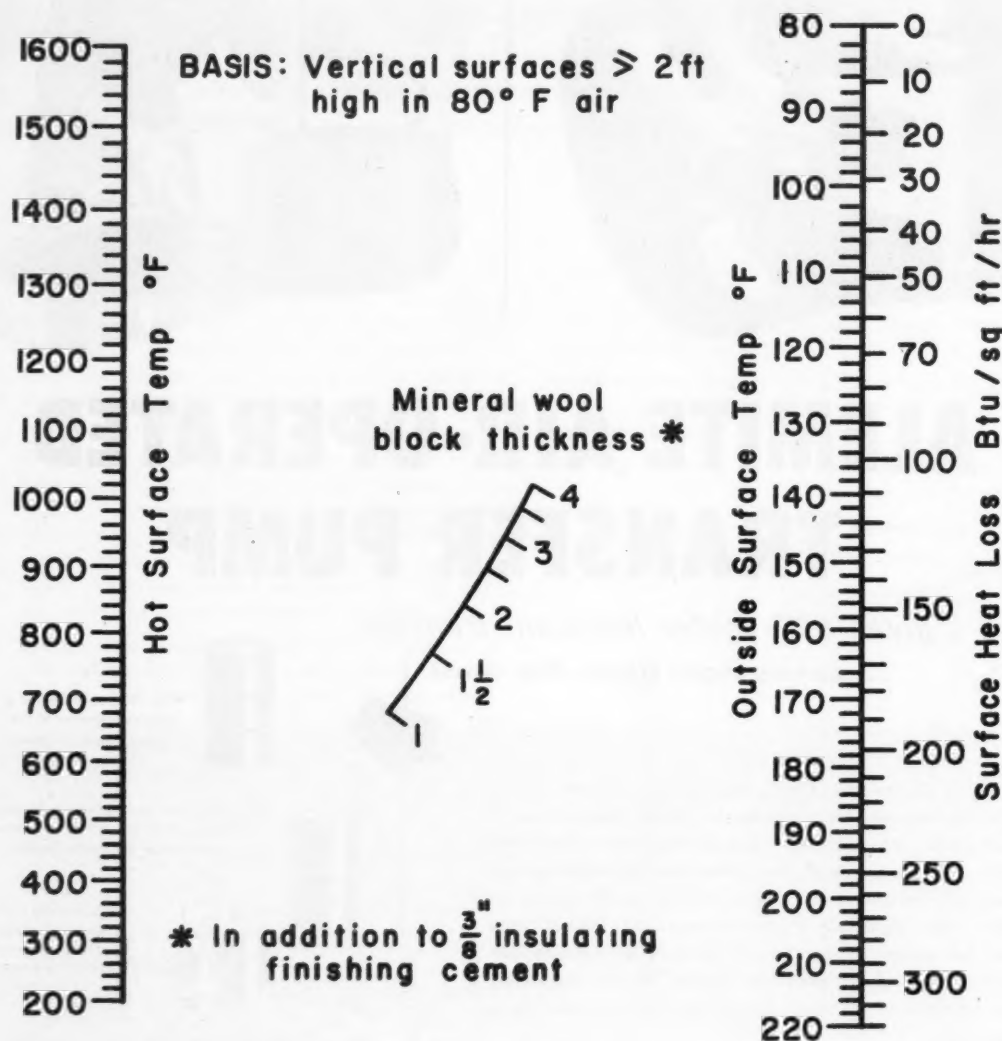
Ask anyone in industry





Surface Temperature and Heat Loss for Block-and-cement Insulation

(Continued from page 200)



Pumping Progress Report FOR CHEMICAL ENGINEERS

An advertisement prepared by The Aldrich Pump Co.,
Member of Hydraulic Institute, U.S.A.

PUMP INSPECTION, MAINTENANCE AND REPAIR are jobs too frequently ignored by pump designers. In a survey of more than 1,500 pump installations, speed and economy of maintenance was frequently quoted as a major factor in pump selection.

SECTIONALIZED FLUID-ENDS offer an excellent means of guaranteeing both speed and economy in pump maintenance. As originated by ALDRICH Pump Co. engineers, fluid ends have only four main assemblies — the working barrel, suction manifold, discharge manifold and stuffing box.

SPEED IN MAINTENANCE comes with ease of accessibility to wearing parts. Manifolds are slid back on studs and valves removed as complete units. Split collar and flange connection of plunger to yoke permit easy removal of plunger.

ECONOMY OF MAINTENANCE comes with speed in maintenance. Even more important is the simple fact that it is cheaper to replace a single section than a complete fluid-end. When corrosive liquids are pumped, this is particularly important.

THE DIRECT FLOW PRINCIPLE, utilizing the sectionalized fluid-end, was developed by the ALDRICH Pump Co. Aldrich Engineers have become known as the people to see about your tough pumping problems. We have never turned down a challenge.

FURTHER INFORMATION can be had direct from the company. Tell us your requirements and we'll send you Data Sheets describing the pump we recommend. Address your request to: The Aldrich Pump Co., 23 Gordon Street, Allentown, Pa.

When inquiring check CP 4515 opposite last page
CHEMICAL PROCESSING

**Describes self-contained unit
for gas chromatography**

Including short explanations on gas chromatography and elution methods of analysis, 12-page booklet describes self-contained instrument for analysis of gases and liquids. Applications suggested include separation of closely boiling isomers of gases and liquids, organic compounds, determination of trace components, analysis of organic acids, alcohols, ketones, aromatics.

Booklet 83 is issued by Burrell Corporation, Dept. CP, 2223 Fifth Ave., Pittsburgh 19, Penna. When inquiring specify CP 4516 on form opposite last page.

**Condensed 100-page supplement
to lab supply catalog**

Catalog supplement describes all instruments, apparatus, glassware, laboratory furniture and accessories added to manufacturer's stock since 1952 publication of main catalog. Booklet is 112 pages. Prices are included. Photographs, where possible, and descriptions are included of each instrument.

Supplement to Cat 111 is issued by Fisher Scientific Co., Dept. CP, 717 Forbes St., Pittsburgh 19, Pa. When inquiring specify CP 4517 on form opposite last page.

**Radiant heat applications
outlined in brochure**

Application of radiant heat to baking, drying, dehydrating, preheating, and degreasing operations is outlined in 20-page illustrated brochure. Typical installations and engineering data to aid users in designing their own radiant heat system are included.

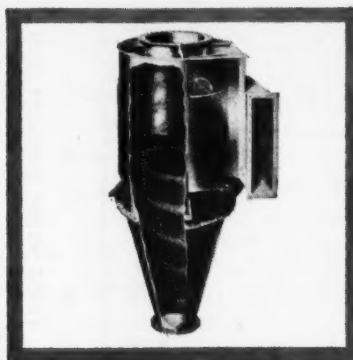
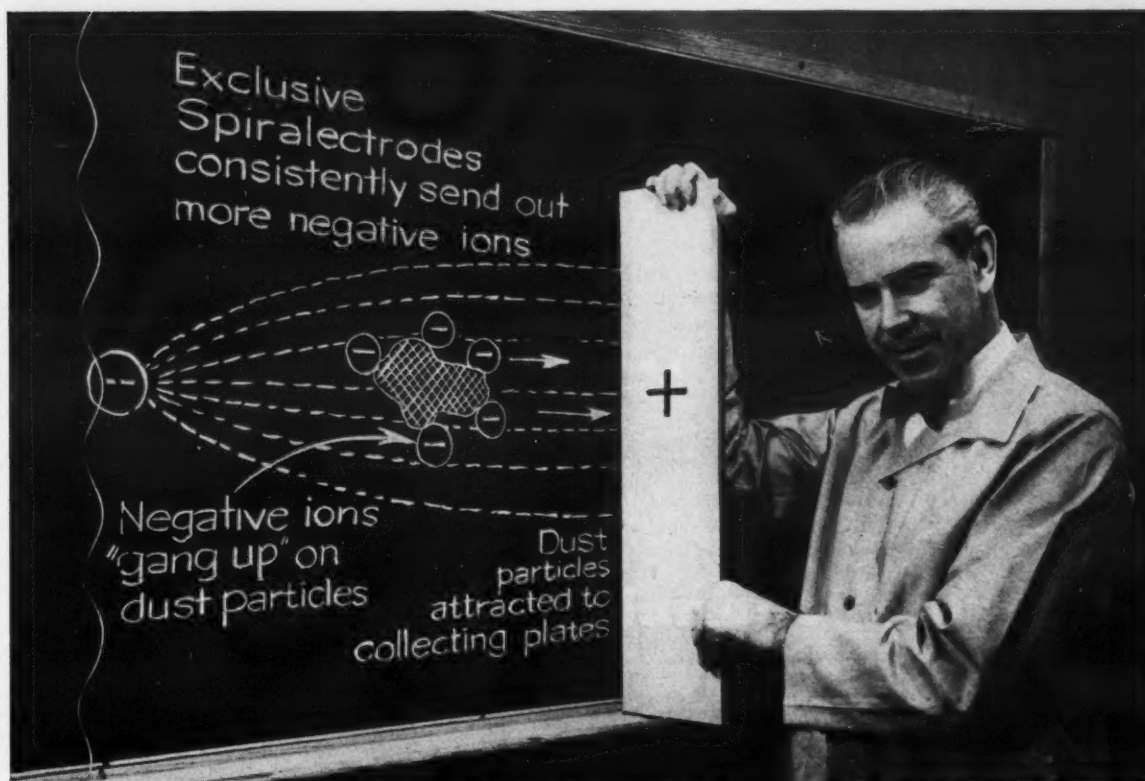
"Applications Unlimited" is available from Fostoria Pressed Steel Corp., Dept. CP, Fostoria, Ohio. Specify CP 4518 opposite last page.

**Seal parts and their function
illustrated by cutaway views**

Colored cutaway views are used to illustrate detailed explanations of seal parts and their functions in 12-page booklet on mechanical seals. General recommended service for each type seal is given together with installation suggestions.

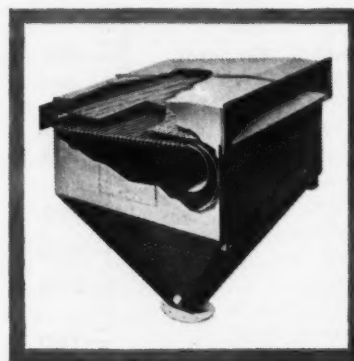
Bul AD-151 is available from The Garlock Packing Co., Dept. CP, Palmyra, N.Y. When inquiring specify CP 4519 on form opposite last page.

How a Buell Collection System "gangs-up" on dust to meet the toughest air pollution codes



Buell Cyclones also deliver extra collection efficiency to "gang-up" on dust: Exclusive Shave-off design harnesses double-eddy current and puts it to work.

With positive gas flow control for peak efficiency... plus continuous cycle rapping to eliminate puffing... Buell's "SF" Electric Precipitator really "gangs-up" on dust (even dust with high resistivity) to permit full production even under the most rigid anti-air-pollution codes.



Buell's Low Resistance Fly Ash Collector combines high efficiency to meet present day strictness, with low draft loss for natural or mechanical draft installations.



FOR THE COMPLETE STORY
Write:

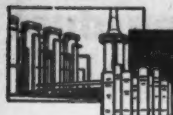
Buell Engineering Company
Dept. 11-C, 70 Pine Street
New York 5, New York

buell



Experts at delivering Extra Efficiency in **DUST COLLECTION SYSTEMS**

When inquiring check CP 4520 opposite last page



Vapor Pressure of Ethanol-water Solutions

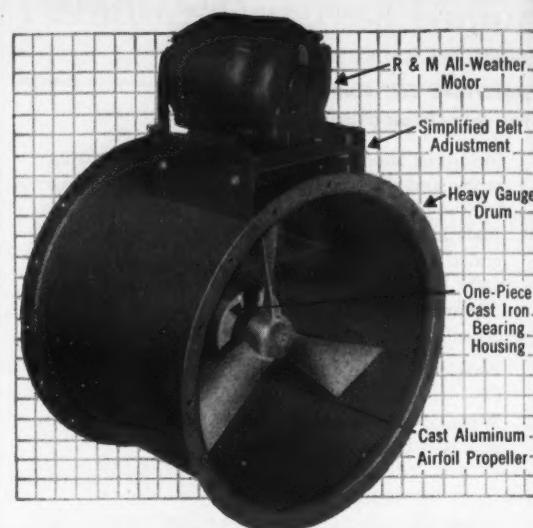
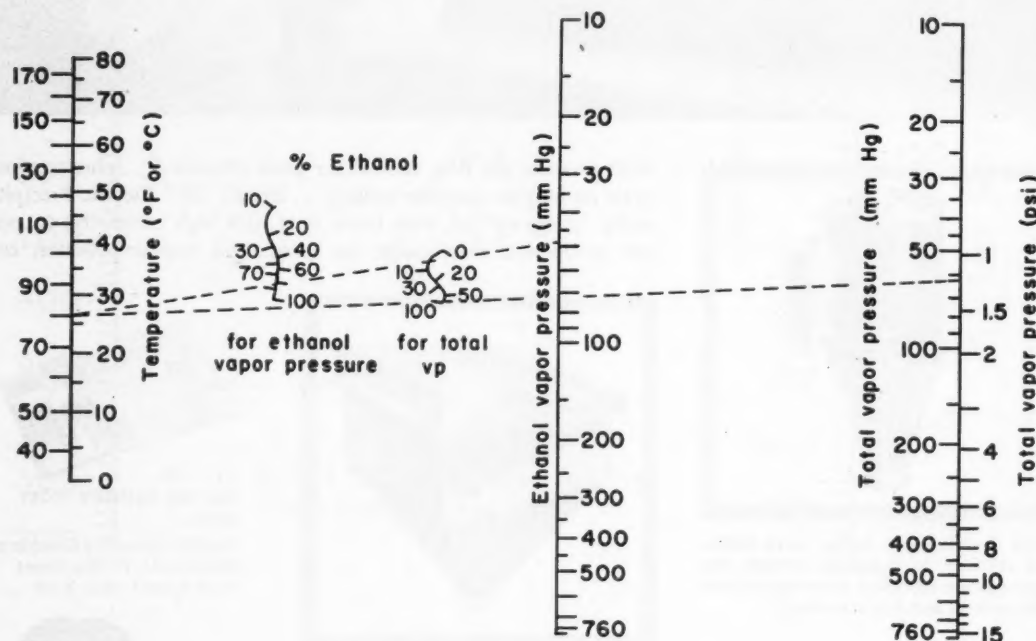
Nomograph by BRUCE FADER, Associate Editor

Ethanol-water solutions are common in plant use. Vapor pressure of these solutions can be important in distillation and in storage. Nomograph presented here shows vapor pressure for ethanol in such a solution, or total vapor pressure of the solution.

Typical Example

If an ethanol-water solution of 80% ethanol is held at 80°F, what is the vapor pressure of ethanol? What is the total vapor pressure?

Align 80°F with 80% on left-hand ethanol scale. Read *ethanol* vapor pressure of 49 mm on ethanol vapor pressure scale. Align 80°F with 80% on right-hand ethanol scale and read *total* vapor pressure of 62 mm on total vapor pressure scale.



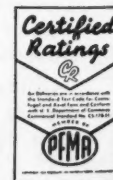
New Tubeaxial Fan

solves tough air-handling problems

Here is Propellair's new answer to your old problem of handling difficult fume removal safely, efficiently and economically. The new Type BT Tubeaxial Fan is specifically designed to handle corrosive and explosive fumes, abrasive dusts, high temperature air... all the difficult air-moving problems. New, cast aluminum-alloy, airfoil propeller assures maximum efficiency. Dependable Robbins & Myers motor is protected inside and out against damaging environments. All sizes are available for immediate shipment.

PROPELLAIR "BT" FANS have the unique new features you've been looking for

1. Drum and streamlined belt tube are rolled from 12-gauge steel plate with gas-tight welds... no seams to leak or collect corrosive condensate. Clean design assures perfect bond of corrosion-resistant coatings.
2. Versatile motor-mount accommodates a wide range of motor sizes... makes motor changes quick and easy.
3. One-piece cast iron housing isolates bearing from the air stream... both bearing seats machined at one setting for permanent, perfect alignment.
4. Special high-strength, cast aluminum-alloy propeller... higher efficiency and greater corrosion resistance.



Write for Bulletin 620-C



Propellair "BT" Fans

DIV. OF ROBBINS & MYERS, INC., SPRINGFIELD, OHIO



Man Cooler



Direct Drive



Sky-Blast



Vaneaxial



Extended Shaft

When inquiring check CP 4521 opposite last page

CHEMICAL PROCESSING

How to take motion pictures through microscope

Booklet of 28 pages describes technique of taking motion pictures through the microscope. It has been prepared as a complimentary publication to the manufacturer's data book "Photography Through the Microscope." Apparatus required is described. Filters are discussed for both color and black and white. Technique suggested is given in a step-by-step method.

"Motion Pictures Through The Microscope" is issued by Sales Service Div., Eastman Kodak Co., Dept. CP, 343 State St., Rochester 4, N.Y. Check CP 4522 on form opposite last page.

Variety of valves illustrated in 32-page catalog

In addition to presenting what is said to be the world's most complete line of forged steel valves, 32-page bulletin tabulates corrosion-resistant metals which are available for trim, seat rings, or entire valve. Among these are Monel, stainless steel, and other alloys. Gate, globe, and angle valves in sizes from 1/2 through 2" are covered.

Supplement 1 to Cat F-9 is issued by Henry Vogt Machine Co., Dept. CP, 10th & Ormsby St., Louisville, Ky. Check CP 4523 opposite last page.

Pictures variety of applications for flexible metal hose

Variety of applications possible with flexible metal hose is illustrated by four pages of photographs in 28-page technical data book. Five sections describe the various types of tubing available, give a brief general description of each, and list complete specifications.

Bul U-333 is available from Universal Metal Hose Co., Dept. CP, 2133 S. Kedzie Ave., Chicago 23, Ill. Check CP 4524 opposite last page.

Open drip-proof motors presented in bulletin

Easy mounting, quiet operation, positive lead identification, and greater protection are advantages obtained with open drip-proof motors covered in twelve-page bulletin. Features of motors are pointed out clearly by sectional views and a number of other photographs.

Bul 1700 is issued by The Louis Allis Co., Dept. CP, Milwaukee 7, Wis. When inquiring specify CP 4525 on form opposite last page.

Now one electrode...

Inco-Rod "A"

...welds most dissimilar alloy joints

Versatile—Dependable

INCO-ROD "A" electrode fills a long-felt need.

It joins many combinations of dissimilar alloys.

Use INCO-ROD "A" electrode to weld mild steel to 304, for example. Or 405 to 304. Or Monel* nickel-copper alloy to 410. Or 347 to Inconel* nickel-chromium alloy.

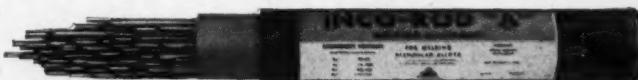
With each combination, the weld is strong and ductile . . . of X-ray quality. Corrosion resistance and mechanical properties usually equal or exceed those of the base metal. What's more, operability is excellent in any position . . . spray type arc . . . good slag removal.

More than thirty such combinations have been welded successfully with INCO-ROD "A" electrode.

Four convenient sizes handily packed. INCO-ROD "A" electrode is supplied in 14-inch lengths in four diameters, 3/32", 1/8", 3/16" and 1/4-inch (the 3/16-inch is center grip) packed in 5-lb., tubular, asphalt-lined, protective containers (NEMA color coded).



Welding Products • electrodes, wires, fluxes



Industry is trying many other combinations . . . both between and among ferritic and austenitic stainless steels, low alloy steels, mild steels, high nickel alloys, and other types of alloys.

Better than 90% of all such jobs can be handled with this one versatile, new electrode . . . INCO-ROD "A" . . . the one with the green flux coating.

For welding data on proven combinations between common alloys, write for 'Announcing INCO-ROD "A"' . . . a new Inco folder. Be sure, too, to ask about alloys *you* commonly join. New data, not yet published, is constantly coming in from the field.

The INTERNATIONAL NICKEL COMPANY, Inc.
67 Wall Street New York 5, N. Y.

*Trade Mark of The International Nickel Company, Inc.

When inquiring check CP 4526 opposite last page



Vapor Pressures of Sodium Carbonate Solutions

By D. S. DAVIS

Professor of Chemical Engineering
Virginia Polytechnic Institute

This nomograph extends the utility of Taylor's data¹ on vapor pressure of aqueous solutions of sodium carbonate. Chart is based on the equation

$$\log p = A - \frac{B}{p + 200}$$

where —

p = vapor pressure mm Hg

t = temperature °C

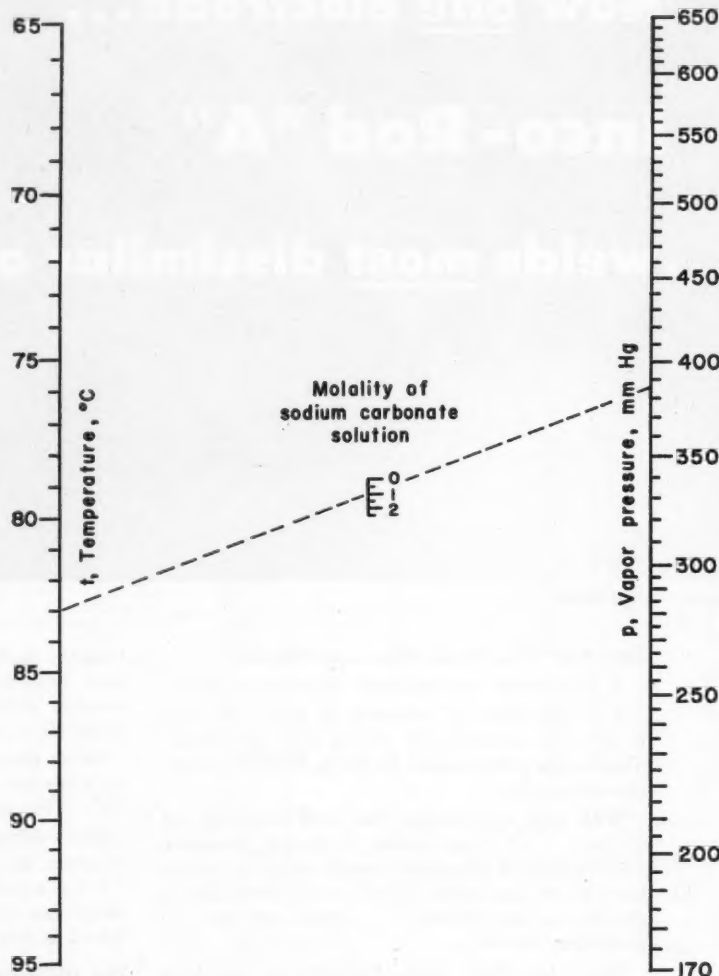
and A, B depend on molality of the solution

Typical Example

Index line shows that a molal aqueous solution of sodium carbonate has a vapor pressure of 386 mm at 83°C.

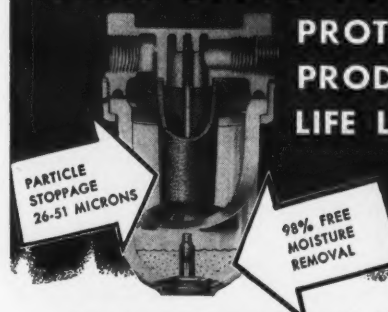
LITERATURE CITED

(1) TAYLOR, C. E., *J. Phy Chem*
Vol 59, p 653 (1955)



Arrow AIR LINE FILTER

PROTECTS
PRODUCTION
LIFE LINES



Arrow Autopneumatic Controls
Prevent Work Stoppage — Save Repairs



- IMPROVE MACHINE AND TOOL EFFICIENCY
- LOWER MAINTENANCE AND REPAIR COSTS
- LESS AIR POWER WASTE—HIGHER OUTPUT

You get every ounce of performance out of your air-powered equipment, cylinders, valves, impact wrenches, tools, etc. with the ARROW AUTOPNEUMATIC CONTROL ASSEMBLY. The compressed air is properly cleaned. The Regulator Valve controls pressure without waste of air and the ARROW Lubricator supplies the correct amount of fine oil mist in the air stream to properly lubricate appliances or tools in operation. The Automatic Trap discharges accumulated sludge to give perfectly conditioned and controlled compressed air for uninterrupted production schedules.

Tool down-time, operator lost time, parts replacements and expensive repairs are practically eliminated.

All the Facts Are Yours for the Asking



Let ARROW field consultants point the way to better production economy at no cost to you. ARROW will be happy to send you their engineering catalog and make recommendations. Your inquiries invited.



ARROW

TOOLS, INC.
1904 S. KOSTNER AVE. • CHICAGO 23, ILL.

When inquiring check CP 4527 opposite last page
CHEMICAL PROCESSING

Advantages of magnetic drive outlined in folder

Construction features and advantages obtained by adjustable-speed magnetic drive are outlined in four-page folder. Uses of drive for both fan-type and constant-torque loads are illustrated. Detailed information on horsepower ratings, speed ranges, and speed control precision as well as important dimensions are included.

Bul 4400-PRD-229 is available from Electric Machinery Mfg. Co., Dept. CP, 1331 Tyler St. NE, Minneapolis 13, Minn. When inquiring specify CP 4528 on form opposite last page.

Summarizes applications of metering pump

Summary of applications and general description of metering pumps is given in seven-page, two-color combination of catalog and data sheets. Representative volumes of fluids ejected are tabulated for various models. Data sheets outline features on fixed gear and dual nozzle models.

Bul 2 is available from Edward E. Robinson, Inc., Dept. CP, 95 Park Ave., Nutley 10, N.J. When inquiring specify CP 4529 on form opposite last page.

Curtain-wall construction details illustrated

Engineering details on curtain-wall construction are illustrated in 27-page catalog. Installation procedures for various types of aluminum windows are presented pictorially. Complete specifications are included.

"Aluminum Windows and Curtain Walls Systems" is available from William Bayley Company, Dept. CP, 1200 Warder St., Springfield 99, Ohio. When inquiring specify CP 4530 on form opposite last page.

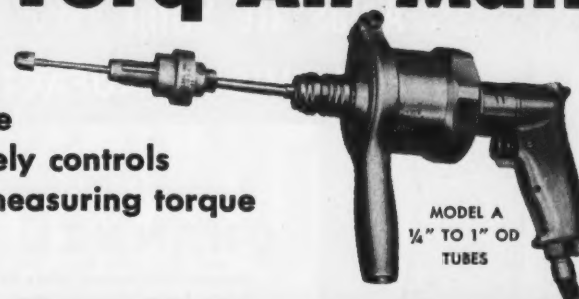
Four major classifications of steel tubing covered

Four major classifications of carbon and allied steel tubing are covered in eight-page catalog. Seamless and electric resistance welded tubing, tube fabricating, and tube forging are described.

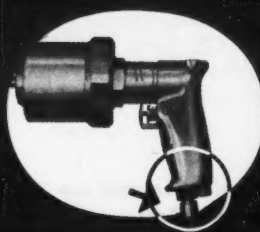
"Ostuco tubing" is available from Ohio Seamless Tube Div., of Copperweld Steel Co., Dept. CP, Shelby, Ohio. When inquiring specify CP 4531 on form opposite last page.

New WILSON Torq-Air-Matic

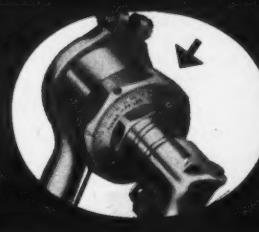
First and only air-driven tube expander drive that accurately controls tube expansion by directly measuring torque output at the mandrel.



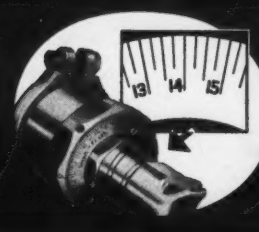
Look at these exclusive design features of the WILSON Torq-Air-Matic



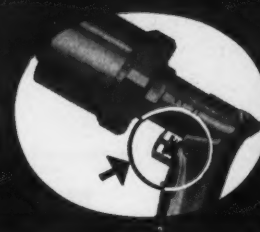
AIR-DRIVEN—Only air-driven tube expander drive with a built-in torque control. Does not require a separate control box, relays or switches. No extra cables or wires; just one small air hose serves it.



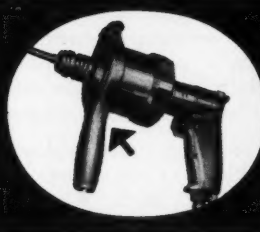
CALIBRATION—The only tube expander control calibrated in terms of foot pounds torque instead of meaningless arbitrary units. Torque requirements for expanding tubes of off-standard jobs can be more readily arrived at.



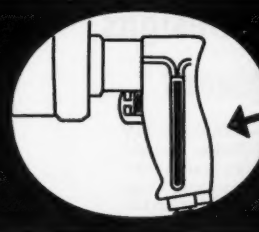
POWERFUL—Rated to deliver fourteen foot pounds torque at 90 psi. This is sufficient to roll 1" OD x 11 gauge boiler tubes.



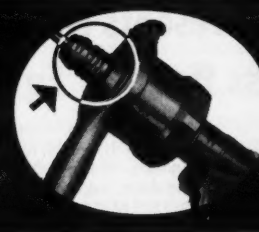
SIMPLE—Only a single three-position trigger throttle for off, forward and reverse. Never any danger of over-rolling because of improper sequence of operation. No juggling of switches; nothing new to learn.



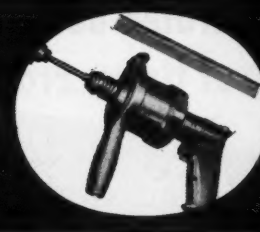
CONVENIENT—Furnished with an auxiliary handle that can be swivelled to any position desired by the operator or left off when the torque reaction is not too great. Basic unit is of a pistol grip design.



TROUBLE-FREE—Has an oil reservoir built into the handle to supply lubrication to the motor. The control section is independent of the motor and lubricated for life.



CHUCK—Simple, new type, snap on floating chuck. Only one motion instantly engages or disengages a square shank mandrel—no set screws.

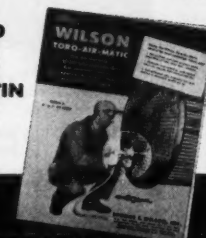


COMPACT—Only 10" overall from pistol grip handle to instant action chuck.

These features speak for themselves. The Wilson air-driven Torq-Air-Matic tube expander drive and control is an important revolutionary advance in the field of precise tube expanding. Here's what you get when you use the Wilson Torq-Air-Matic control

for heat exchanger tubes: (1) uniform and tight pressure joints, regardless of tube sheet hole variation; (2) no over-rolled or under-rolled tubes—no stresses that shorten tube life; (3) extended tube expander life, more production, higher profits.

SEND FOR BULLETIN 55



THOMAS C. WILSON, INC.

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MANUFACTURERS OF TUBE CLEANERS, TUBE EXPANDERS AND TUBE MAINTENANCE TOOLS

When inquiring check CP 4532 opposite last page

Acids are Safer *Two Ways*
FOR THIS MANUFACTURER!

Chemi-Drain CHANNEL PIPE

1. Channels Not Sulphuric Dilute for Processing
2. Safely Drains Corrosive Waste Chemicals

Harkness & Cowing Division of Arnold-Hoffman & Co., Cincinnati, solved a dual acid channeling problem with Chemi-Drain. It carries hot sulphuric dilute to a tiled vat for a tallow reclaiming process, and intermittently, serves as a drain system for corrosive chemicals. Chemi-Drain is completely unaffected by acids or other corrosives. It is designed for flush-with-the-floor installations that can be covered by a grill or removable plate. Write for a four-page bulletin with full details.

LC-256-6



THE LOGAN CLAY PRODUCTS COMPANY • BOX 698J, LOGAN, OHIO

When inquiring check CP 4533 opposite last page

Illustrated Bulletin Presents Newest Designs of Union Process Heating Equipment



Just published, illustrated Bulletin DV presents the full line of Union Process Heating Equipment for use in a tremendous variety of applications: high temperature molding; manufacturing paint, varnish, etc.; processing food products; plating tin; melting solders, asphalt; evaporating high boiling materials; petroleum refining . . . plus numerous others.

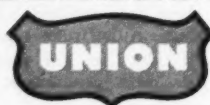
Designed for use with Dowtherm "A" and "E", Para-Cymene, Anisole, Aroclor #1248 and Heat Transfer Oil, Union Process Heating Equipment assures accurately controlled temperatures over a broad range at low pressure.

The complete story can be obtained by mailing the attached coupon to Union Iron Works, Erie, Pa.

UNION IRON WORKS
1555 Cascade Street, Erie, Pa.

MAIL your new Process Heating Bulletin DV to us, without obligation.

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City Zone State



It's Yours
For The
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When inquiring check CP 4534 opposite last page

NEW LITERATURE

Applications and features of magnetic drums

Applications and features of permanent magnetic drums are described in six-page bulletin. Units remove tramp iron or other ferrous material from gravity or conveyor-transported products. Bulletin includes diagrams, performance data, application guides, and descriptions of drums.

Bul MD-200 is issued by The Homer Manufacturing Co., Inc., Dept. CP, Lima, Ohio. When inquiring specify CP 4535 on form opposite last page.

Treats selection and use of dehumidifiers

Pertinent factors relating to selection and use of sprayed coil dehumidifiers are discussed in 20-page, two-color bulletin. Included are formulas and special tables and curves for use in selection of proper unit size. Design and construction features of sprayed coiled units and typical specification sheet, for use as a guide for preparing specifications for dehumidifier installations, are also presented.

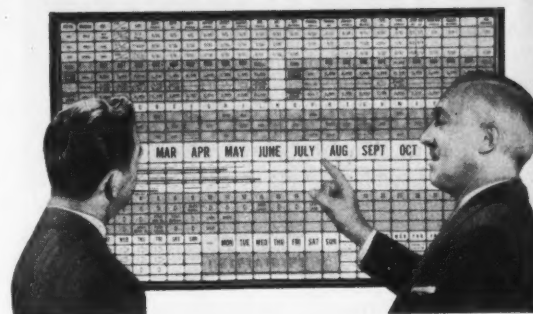
Bul 7827-H is issued by American Blower Corp., Dept. CP, Detroit 32, Mich. When inquiring specify CP 4536 on form opposite last page.

Organic chemical addendum

Forty-nine new chemicals that have been added to manufacturer's organic chemical line are listed in octavo-size listing. Many price changes and removals are also given in this 16-page supplement of Eastman Organic Chemicals List 39.

Announcement 39-1 is issued by Distillation Products Industries, Div. of Eastman Kodak Co., Dept. CP, 343 State St., Rochester 3, N.Y. When inquiring check CP 4537 on form opposite last page.

How To Get Things Done



BOARDMASTER VISUAL CONTROL

Gives you a Graphic Picture of your operations, spotlighted in color. You See what is happening at a glance. Facts at eye level — saves you time, prevents errors.

Simple, flexible — easily adapted to your needs. Easy to operate. Type or write on interchangeable cards, snap in grooves. Ideal for production, scheduling, sales, traffic, inventory, etc. Made of metal. Compact, attractive.

Complete Price **\$49⁵⁰** Including Cards

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24-Page Illustrated Booklet AA-20
Mailed Without Obligation

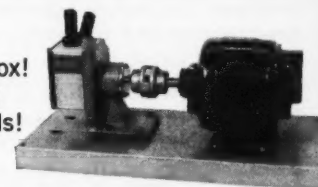
GRAPHIC SYSTEMS 55 WEST 42nd STREET
NEW YORK 36, N. Y.

When inquiring check CP 4538 opposite last page

THE PROBLEM: PUMPING SULPHURIC ACID

THE SOLUTION: VANTON PLASTIC PUMP

No stuffing box!
No gasket!
No shaft seals!



A leading producer of welding gas had the problem of transferring concentrated sulphuric acid (93%) from storage to process tanks. The pump had to operate 6 to 10 hours daily and deliver 10 gpm against a 15 ft. head. The answer was found in a Vanton "flex-i-liner" pump, model PX60, with its polyethylene body block and hypalon flexible liner.

If you're troubled with pumping corrosive or abrasive liquids and slurries, get the facts on the Vanton "flex-i-liner."

Catalog 55 on request.

VANTON
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division of Cooper Alloy Corporation

When inquiring check CP 4539 opposite last page

CHEMICAL PROCESSING

When plans
call for

ACID PLANT VESSELS

custom fabricated on the West Coast

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PUGET SOUND FABRICATORS

Your "on the spot" source with over 55 years of experience in handling a wide variety of fabricating jobs involving steel plate and alloys up to 1" thickness
SUPPLY PRINTS FOR PROMPT QUOTATION ON YOUR NEXT JOB



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GASKETS · SHIMS WASHERS

From 1 to 1 Million

No matter what type, thickness, shape or quantity required, you can count on Chicago-Wilcox for uniformly accurate gaskets, shims, washers or special stampings.

With 50 years accumulation of dies, chances are we can furnish just what you need without a die charge—thus reducing costs substantially and assuring on-schedule delivery.

Gaskets, shims and washers can be supplied in metallic, non-metallic and plastics . . . teflon, nylon, etc. . . and in quantities to meet your production requirements.

Write for catalog and submit your specifications for quotation.

CHICAGO-WILCOX MFG. CO.

7701 South Avalon,
Chicago 19, Illinois

When inquiring check CP 4541 opposite last page

MARCH 1956

NEW LITERATURE

Guide for selecting an engineering firm

Criteria for determining suitability of engineering staff to undertake design problems and an outline of guide posts for selecting an outside engineering firm are covered in 17-page guide. Characteristics of engineering installation, project engineering, and engineering design firms are differentiated.

"A Guide for Selecting an Engineering Firm" is available from Group P, The Teller Company, Dept. CP, Butler, Pa. When inquiring specify CP 4542 on form which is located opposite last page.

Illustrates entire line of leather guards

Printed in two colors, 24-page catalog shows entire line of safety equipment made of leather. Safety belts, holsters, slings and associated hooks, and other hardware are shown. Industrial aprons and guards for tools are also illustrated.

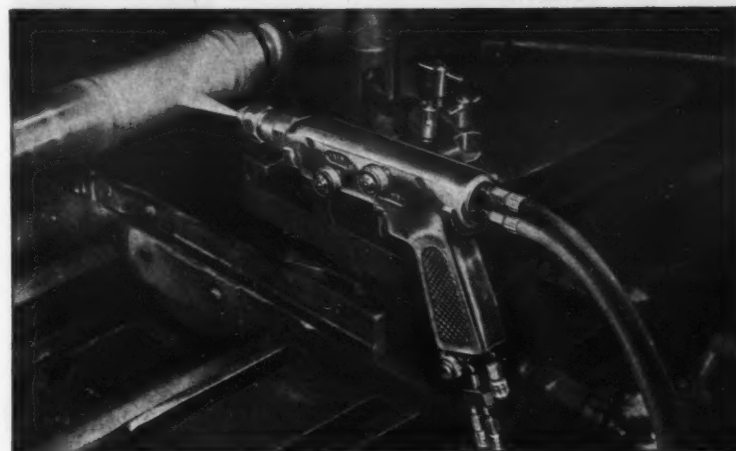
Cat B-54 is issued by R. H. Buhrke Co., Dept. CP, 1403 W. Congress St., Chicago 7, Ill. When inquiring specify CP 4543 on form which is located opposite last page.

"Do it yourself" model kits

"Do it yourself" model kits for designing chemical plants and oil refineries are described in four-page bulletin. Kits may be used over and over again and are said to pay for themselves quickly by eliminating many charts, drawings, etc. Literature lists companies using kits.

Bul "Do it Yourself" is issued by Industrial Models, Inc. (Ohio), Dept. CP, 2311 Sconset Road, Wilmington 3, Del. When inquiring specify CP 4544 on convenient Reader Service slip opposite last page.

STOP CORROSION

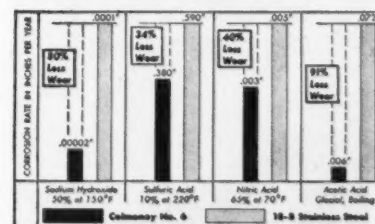


with Colmonoy Sprayweld Hard-Facing

The superior corrosion resistance of Colmonoy No. 6 alloy makes it the ideal hard-facing material for use on metal-to-metal wearing surfaces operating under corrosive conditions.

The Colmonoy Spraywelder puts No. 6 on fast, in powder form. It makes smooth overlays within .010" of desired size, requiring a minimum of finishing. Sprayweld overlays are solid, non-porous, and welded to the base metal.

The corrosion of vital process equipment parts becomes needless waste when the wear resistant qualities of Colmonoy No. 6 are combined with the economy and ease of the Spraywelder. The answer to such waste by more and more cost conscious companies is "Stop corrosion with Colmonoy."



This table shows the comparative resistance to corrosion of Colmonoy No. 6 and 18-8 stainless steel. No. 6 is resistant to almost all caustics and acids. Ask for Engineering Data Sheet No. 3.



Write today for the Sprayweld Catalog and for Colmonoy Hard-Facing Manual No. 79, which describes all the Colmonoy hard-facing alloys and methods.

HARD-FACING ALLOYS

19345 JOHN R STREET **WALL COLMONOY** DETROIT 3, MICHIGAN

BIRMINGHAM • BUFFALO • CHICAGO • HOUSTON • LOS ANGELES
LONDON, N. J. • MORRISVILLE, PA. • PITTSBURGH • MONTREAL • GREAT BRITAIN

When inquiring check CP 4545 opposite last page

Less than one part per million impurity

remains during low cost gas purification with

DEOXO purifiers

**NO MAINTENANCE
NO OPERATING COST
NO REACTIVATION**

**CATALYTIC OPERATION
AT HIGH OR LOW PRESSURE:**

AT ROOM TEMPERATURE:
Removal of oxygen (up to 3%)
and/or hydrogen (up to 6%)

AT 125° CENTIGRADE:
Conversion of CO to CO₂

AT 250° CENTIGRADE:
Methanation of CO to CH₄

AVAILABLE CAPACITIES:
25 CFH to 500,000 CFH and larger. Special
units designed for specific requirements.

Write for FREE, informative booklet No. 10 and technical assistance.

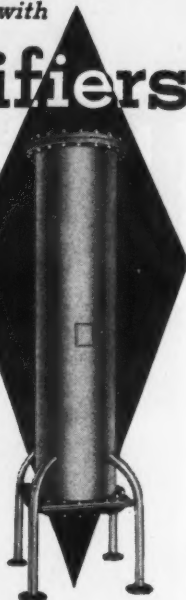
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When inquiring check CP 4546 opposite last page



VIKING + GOOD PUMPS = GOOD PIPING = GOOD PUMPING

Positive displacement pumps with smooth, even discharge like you will get with all Viking pumps . . . plus ample size piping with least number of bends and elbows . . . means good pumping at lowest cost, on either thick or thin liquids.

If you are looking for these results, specify Viking. To start, send today for Bulletin 56Sec.



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CEDAR FALLS, IOWA, U.S.A.

In Canada it's "ROTO-KING" Pumps

SEE OUR CATALOG IN SWEETS

When inquiring check CP 4547 opposite last page

NEW LITERATURE

Urea and melamine coating resins

Recently revised booklet gives twelve pages of description of Plaskon urea and melamine coating resins for industrial baking enamel systems. Properties, suggestions for use, typical formulations are given with charts showing cure rates.

"Plaskon Urea and Melamine Coating Resins" is issued by Barrett Div., Allied Chemical & Dye Corp., Dept. CP, 40 Rector St., New York 6, N.Y. When inquiring check CP 4548 on form which is located opposite last page.

Technical manual covers nickel-plated steel

Description of nickel-plated steel products, which provide low-cost protection against contamination and corrosion, are covered in twelve-page manual. Forming, welding, cleaning, handling, and testing procedures are included.

Bul CS-858 is issued by Wickwire Spencer Steel Div., The Colorado Fuel and Iron Corp., Dept. CP, 575 Madison Ave., New York 22, N.Y. When inquiring specify CP 4549 on form opposite last page.

Vibrating screens reviewed

Vibrating screens are described in 20-page catalog. Units are designed for mining, cement and aggregates-producing fields. Suggestions for estimating screen capacity and proper screen installation are also included.

Cat "Super Service Vibrating Screens" is issued by Pioneer Engineering Works, Inc., Dept. CP, Minneapolis 13, Minn. When inquiring specify CP 4550 on form which is located opposite last page.

ELECTRIC MOTOR-ARMOR PROTECTS

*Against shorts and burn-outs due to
moisture, condensation and humidity.*

**MOTORS - all types
SOLENOID SWITCHES
FIELD COILS, TRANSFORMERS
STARTER SWITCHES, WIRING
MAGNETIC PULLEYS
IGNITION SYSTEMS**

*Reduces "Down Time"
Saves Costly Repairs*

No expensive or special equipment.
All you need is any vessel large
enough to completely submerge the
unit to be treated. Then, simply air-
dry.

INDUSTRIAL MAINTENANCE SUPPLY

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CLEVELAND 1, OHIO

Opportunities for responsible Sales Engineers

When inquiring check CP 4551 opposite last page

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You get a "quick look" at the most valuable articles being published in this field, and kindred fields . . . by reading the "BRIEFS" section of CHEMICAL PROCESSING every month.

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... Stop Leakage!

use SEAMLEX ROTARY

the
Rotary Joint
for Steam,
Water, Oil,
Air, etc.



For the admission of liquids or gases into revolving drums, calenders, dry cans, etc., SEAMLEX Rotary Joints ensure uninterrupted production, minimum power consumption and lowest maintenance.

Compact, light-weight SEAMLEX ROTARYS are designed to render long, continuous service, free from leakage.

External Screw Adjustment provides means to compensate for normal wear, without removal of joint from equipment. Floating Graphite Seal prevents excessive wear. Pressure Equalizing Chamber reduces power consumption.

Seamlex Rotaries
are provided with
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Take advantage of SEAMLEX Company's many years of experience in design and manufacturing. Write today for FREE Bulletins 955 & 5500A.

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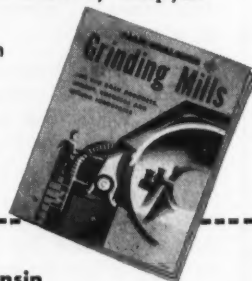
● Since 1928, SEAMLEX Products are QUALITY Products. ●

When inquiring check CP 4552 opposite last page

Get Complete Facts On... ROD MILLS BALL MILLS PEBBLE MILLS

Write for this useful 44 page book, bulletin 07B6718A. Full of helpful facts on:

- Grinding media action
- Mill applications
- Wet vs dry grinding
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When inquiring check CP 4553 opposite last page

NEW LITERATURE

Summarizes specs on pyrometers

Suggesting why pyrometers may be a preferred means of measuring temperature, booklet in two colors of eight pages includes specifications on both panel and portable models. Thermocouples, thermobulbs, and accessories are also discussed. Section is included on air velocity meters for measuring air velocities from 20 to 24,000 fpm. A dew point indicator is also described.

"Pointer Bulletin" is issued by Illinois Testing Laboratories, Inc., Dept. CP, 420 N. LaSalle Street, Chicago 10, Ill. Specify CP 4554 on form opp. last page.

Biochemicals cataloged

Biochemicals and organic preparations are listed alphabetically in 14-page, pocket-sized catalog. Over one hundred chemicals are listed with quantities available and prices. Portions of the catalog are done in a light vein.

"Biochemical and Organic Preparations — Fall 1955" is issued by Sigma Chemical Co., Dept. CP, 4648 Easton Ave., St. Louis 13, Mo. Specify CP 4555 opposite last page.

Closed-circuit drying discussed

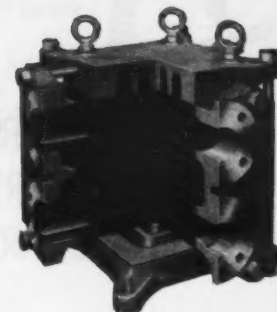
Use of Turbo-dryers in closed circuit for continuous drying, cooling, or subliming materials which are fragile, heat sensitive, oxidizable, wet with hazardous solvents, etc, is described in four-page bulletin. Cutaway views and installation photos are also included.

Bul 5507 is issued by Wyssmont Company, Inc., Dept. CP, 42-09 27th St., Long Island City 1, N.Y. Specify CP 4556 opposite last page.

ONLY Impervite Gives You All Basic Designs Of IMPERVIOUS GRAPHITE HEAT EXCHANGERS

CUBICAL

Provides greatest amount of transfer surface possible for size of exchanger. (Example: Model 4 can provide 50 sq. ft. on one side and 90 on the other). This IMPERVITE exchanger can be operated up to 150 psi, 340° F. They can be easily modified to permit change of application, and special interconnectors allow economical use of banks of CUBICAL exchangers.



TUBE AND SHELL

You can get quick shipment on famous standard IMPERVITE tube and shell exchangers in sizes from 7 to 650 tubes, 9 and 12 ft. in length. In addition, flexible design and production facilities at Falls Industries enables custom units to be fabricated quickly and economically for practically any application.

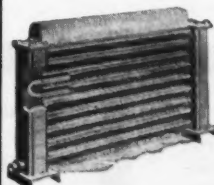


Design of these exchangers is such that corrosives only come into contact with IMPERVITE impervious graphite. This material is unaffected by the action of all corrosives except a few highly oxidizing agents, is immune to effects of thermal shock, and possesses an exceptionally high rate of thermal conductivity. An extensive variety of standard and special IMPERVITE processing equipment is available from Falls Industries for long-life, corrosion-free service.



CROSSBORE

This new exchanger design is an exclusive Falls' development, which incorporates a "one-piece" bundle. It withstands operating pressures in the 150-200 psi range, resists greater physical shock, and is exceptionally easy to clean. Extreme simplicity of design provides truly maintenance-free operation.



CASCADE

All models utilize specially constructed low-pressure-drop cells. All tubing is extruded by an improved method which practically eliminates spalling at high temperatures and results in more uniform heat transfer characteristics.

WRITE FOR CATALOGS

Falls Industries Inc.

31909 AURORA ROAD • SOLON, OHIO
PHONE: CHURCHILL 8-5357 • TELETYPE NO: Solon 8-720

When inquiring check CP 4557 opposite last page

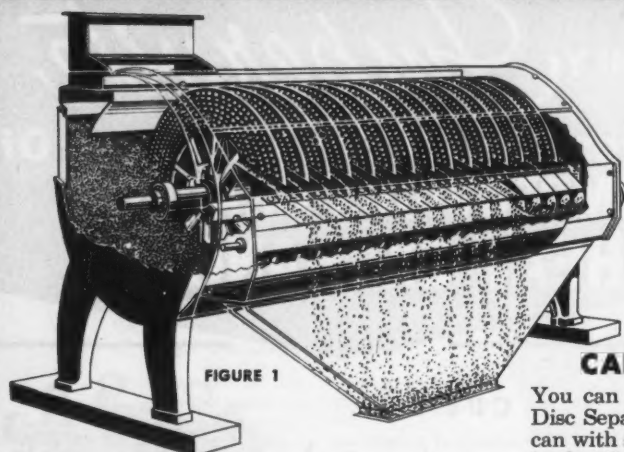


FIGURE 1



FIGURE 2

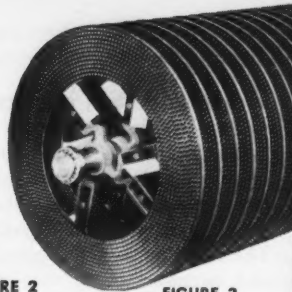


FIGURE 3

CARTER DISC SEPARATORS

You can size free-flowing materials with Carter Disc Separators much more accurately than you can with screens. That's because Carter discs size by *length* differences. In each disc there are hundreds of under-cut pockets which lift short material and reject long material that does not fit into the pockets. Fig. 1 shows how material flows through the Disc Separator. Fig. 2 shows how the discs lift or reject. A series of discs is shown in Fig. 3. Sizes of Carter Disc Separators differ in the number of discs and in the diameter of the discs, and there is a wide range of pocket sizes and styles.

FOR ACCURATE LENGTH SIZING OF FREE-FLOWING GRANULAR MATERIALS

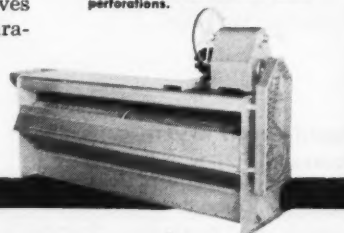
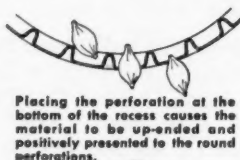
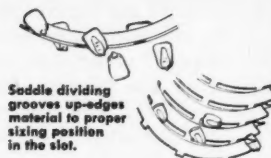
HART UNI-FLOW CYLINDER SEPARATORS



While Disc Separators perform precise separations, Uni-Flow Cylinder Separators are recommended when you need less accuracy or more flexibility. In the Uni-Flow Separator the material is lifted by semi-spherical indents (A) that line the inside surface of the cylinder. The operator controls the separation by raising or lowering the separating edge (C) of the trough (B) into which the lifted material falls.

CARTER PRECISION GRADERS For Sizing by Thickness or Width

Because of the unique design of the perforated cylinders used in Carter Precision Graders, these machines make separations to a degree of accuracy hitherto unobtainable. Thickness separations are made by slots at the bottom of grooves in the cylinder. Width separations are made by recessed round perforations in the cylinder.



FREE TESTING You are invited to send—or bring—samples of your materials to the Hart-Carter laboratory for free testing. (Ask us about the size sample required.) Results will be kept confidential. Knowing your requirements, Hart-Carter will recommend the machines you need. Hart-Carter machines are being used to size such materials as polyethylene and nylon cubes, and catalyst pellets. **WRITE FOR FOLDERS** that describe in detail the sizing methods used by each kind of machine.



HART-CARTER CO.

677 19th Avenue N.E., Minneapolis 18, Minn.
Phone: Sterling 9-2417

MACHINERY FOR SIZING FREE-FLOWING GRANULAR MATERIALS BY DIMENSIONAL DIFFERENCES

Air Pollution

(Continued from page 7)

industries can still profit from the errors of others. The political upheaval and name-calling that are beginning to plague such communities as Louisville, Houston, Salt Lake City, and North Jersey should be a warning to other industrial centers. Enlightened industry can well unite on a 4-point program:

1. Measure its current effluents for both composition and rate of emissions
2. Cooperate either industry-wide or with control authorities to measure the amount, extent, variation, and effect of the unnatural components of the atmosphere
3. Devise abatement methods based on facts
4. Keep the public informed

It's not too late yet, but time is running out. To mix the axioms: when hindsight is expensive, it's prudent to be foresighted.

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You doubtless have noted names and addresses of manufacturers at the end of editorial articles in **CHEMICAL PROCESSING**. Have you wondered, "Is this some sort of advertising?"

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This is one of our extra Reader Services, pioneered in this field by **CHEMICAL PROCESSING** in 1938.

THE EDITORS

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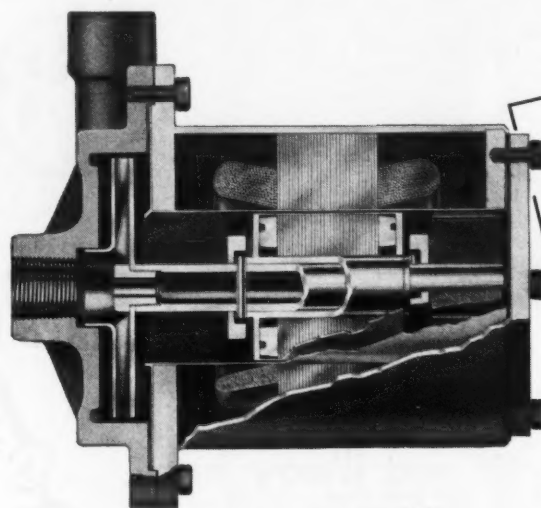
PROCESSES, EQUIPMENT and MATERIALS



Use this "quick-locator" when you want information on a specific type of process, equipment or material mentioned in the processing stories or the advertisements in this magazine. Everything discussed in this issue is given here, if you want more data you can write manufacturer direct . . . or turn to last page and use the handy "Information Request Slip." This is a special service provided by the publisher . . . no obligation or charge, of course. The publisher contacts the proper manufacturers for you—information comes to you direct.

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• For complete details, write for Bulletin 1030
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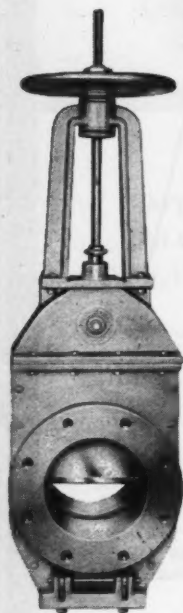
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Type



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Type
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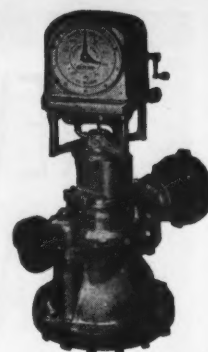
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for all liquid- handling problems

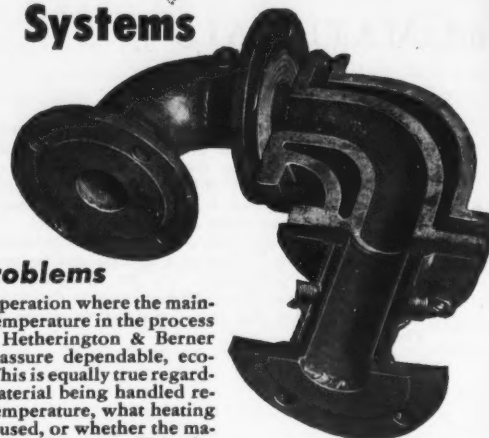
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Bulletin J-50. If you have a liquid batching problem, involving either light or heavy liquids, jacketed or un-jacketed construction, investigate the *Fluidometer System*. This system gives accurate, dependable and completely automatic batching and is adaptable to practically any liquid measuring problem, whether it involves gallons, barrels or tank cars. Write for Bulletin FI-49.

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SPRINGFIELD, OHIO

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Exploring the operating advantages of Goulds Fig. 3715 chemical pump.

Take this pump apart right in your office ... and you'll see how it can save you money

You'll find new features in the Goulds Fig. 3715 chemical pump.

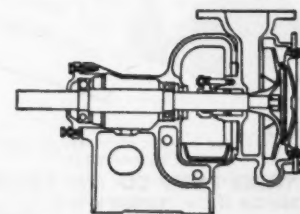
They're features that make it a rugged, dependable, long-lived pump for handling corrosive liquids. And you can check them yourself without moving away from your desk.

We've built an aluminum model of the Fig. 3715 pump—complete in every detail. Ask your Goulds representative to show it to you.

You can open it up, take it apart, and see in detail such features as the

easy method for adjusting impeller clearance—the chamber for cooling the support head so that you can operate the pump up to 350° F.—the design that permits you to inspect and clean the inside of the pump without disturbing the piping.

Call your Goulds representative today. Tell him you'd like to examine the Fig. 3715 model and he will gladly set a date at your convenience. Or write us in Seneca Falls and we'll make the arrangements promptly.



CROSS SECTION of Fig. 3715 pump.

You can get the Goulds Fig. 3715 pump in an alloy to meet your liquid handling requirements, including 316 and Gould-A-Loy 20 stainless steels, all iron, all bronze, bronze-fitted,—iron with stainless trim, or bronze with stainless trim. And it's available in 9 sizes providing capacities up to 720 GPM, and heads up to 200 ft. For additional details write for Bulletin 725.4.



Atlanta • Boston • Chicago • Houston • New York • Philadelphia • Pittsburgh • Tulsa

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PUMP STUFFING BOXES

INFORMATION
suggesting solution
of common stuffing
box difficulties;
available in newly
revised
BULLETIN S-147

Fig.
19,488

Number of rings, depth
of box, type of pack-
ing ... chemical and
physical properties
of the fluid being
pumped, speed of
shaft and other
pertinent usa-
ble facts are
in this Bulletin.

WRITE on business stationery for your
copy of Bulletin S-147.
TABER PUMP CO. (Est. 1859)
220 ELM ST. + BUFFALO 3, N. Y.

Fig. 6041

TABER

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A Book You Should Have on Mechanical Sealing...

A complete reference catalog on
Dura Seal—the engineered mechan-
ical seal that rotates with the shaft.
Amplly illustrated . . . specific appli-
cations . . . installation data. A fact
book of real value to designers, oper-
ators and maintenance departments.

WRITE FOR DURA SEAL CATALOG NO. 455 CP
DURAMETALLIC CORPORATION

When inquiring check CP 4565 opposite last page

alphabetical
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on
page 213

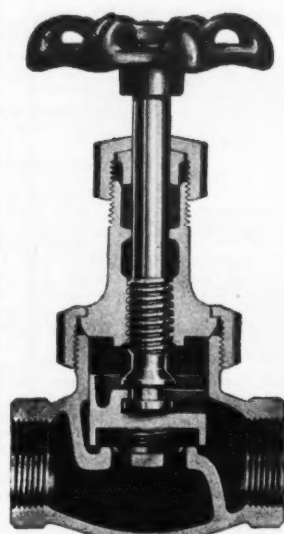


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issue's editorial columns and advertisements, turn
to page 213. "Quick-locator" starting on that page
was a feature in CHEMICAL PROCESSING years
ago. It means extra work for the Editors, but it
helps you, the reader, in finding what you want . . .
in a hurry!

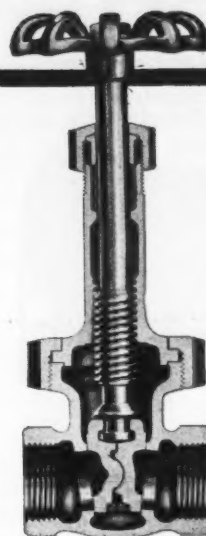
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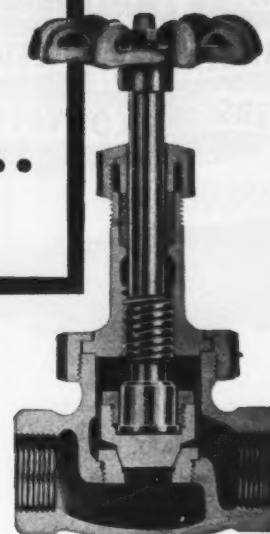
Walworth bronze valves...



Walworth No. 95 Globe Valve
Re-New-Disc



Walworth
No. 29 Gate Valve



Walworth No. 225P Globe Valve
500 Brinell Seat and Disc

**built to give
dependable trouble-free service
on all recommended jobs**

Walworth No. 95 Bronze Globe Valves (Angle Type: No. 96) are recommended for service where throttling is not required. They are rated at 150 psi working steam pressure, 500F; 300 psi cold water, oil or gas. The improved renewable disc and lock-on, slip-off disc holder — an original Walworth development — saves time and trouble. This valve can be repacked under pressure when fully opened. All parts are designed to give maximum service and strength.

Walworth No. 29 Bronze Gate Valves are rated at 200 psi working steam pressure, 550F; 400 psi cold water, oil and gas. These valves have rising stems and integral seats. Sizes 2-inch and smaller have union bonnets; sizes 2½ and 3-inch have bolted bon-

nets. Valves up to and including ¾-inch have solid wedge discs; 1-inch and larger have split wedge discs. These valves can be repacked under pressure when fully opened.

Walworth No. 225P Bronze Globe Valves (Angle Type: No. 227P) are rated at 350 psi working steam pressure, 550F; and 1000 psi non-shock service on cold water, oil and gas. The stainless steel, plug type seat and disc — heat treated to 500 Brinell — can be closed on sand, slag, scale and similar floatage, without injury to the seating surfaces. They are the longest wearing, TOUGHEST bronze valves you can buy.

For full information about Walworth Quality Bronze Valves, see your Walworth distributor, or write:



GLOBE



GATE



ANGLE

WALWORTH valves and fittings

60 EAST 42nd STREET

NEW YORK 17, N. Y.



CHECK

When inquiring check CP 4567 opposite last page

DRYERS

AMMONIATORS*

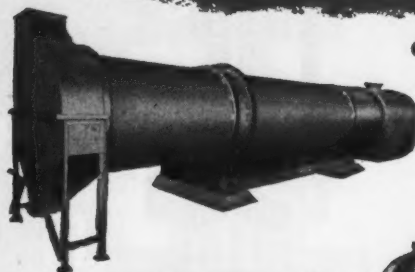
GRANULATORS*

ELEVATORS

COOLERS

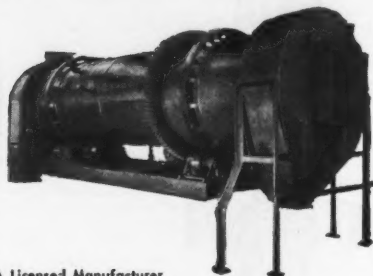
CONVEYORS

for the
**Chemical
Industry**



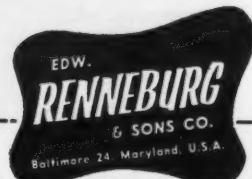
CONVENTIONAL DRYER

Heavy-duty rotary unit with furnace, burner, breeching and air handling system. Used for ammoniated granular fertilizers and other chemicals. Also Dehydr-O-Mat Variable Inclination Dryers (Pat. pend.).



ROTARY COOLER

Highly efficient shelf design for quick thermal release, with special feed and discharge breechings. Rotary seals prevent air losses.



* TVA Licensed Manufacturer

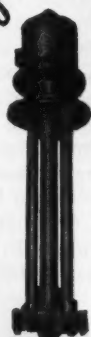
Literature and information on request.

When inquiring check CP 4568 opposite last page

**Nagle Pumps ARE
A COMFORT TO HAVE**

**WHEN YOU'RE 3500
MILES FROM THE
FACTORY!**

One of ten Nagle 2" type "QW-B" vertical shaft, centrifugal pumps is pictured recirculating spillage to a concentrator at the Paragsha Copper Concentrating Plant of Cerro de Pasco Corp., in Peru. Pump is suspended from chain hoist between guide rails for easy raising and lowering. Fifteen Nagle pumps used at this plant. The "QW-B" is a wet pit pump with shaft bearings enclosed in a quill. It is as efficient, foolproof and free of maintenance as a pump can be — a good pump to have when



you're far from the source of supply. Like all Nagle Pumps, the "QW-B" is designed for abusive service—to handle abrasive or corrosive mixtures, slurries, hot liquids. There's a Nagle horizontal shaft or vertical shaft pump for every abusive pumping job. Ask for Catalog 5206.

**NAGLE
PUMPS**

NAGLE PUMPS, INC.
1247 CENTER AVE., CHICAGO HEIGHTS, ILL.

PUMPS FOR ABRASIVE AND CORROSIVE APPLICATIONS

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Remarkable!

Chempro's new Style FM-4 bearings, bushings, washers, etc., have given remarkable service in pumps, mixers and reactors operating under highly corrosive conditions. Made of Teflon,* glass, graphite and an inert lubricant, Style FM-4 bearings and bushings are hard, corrosive-resistant, have a low coefficient of friction, and compare favorably in wearability with those made of metal.

FOR EXAMPLE:

If other bearing materials on your pumps have failed due to corrosion... use FM-4.

If the shaft bearings on your mixers and reactors must be compatible with the product... use FM-4.

Also available in rod, tube and cylindrical shapes in a wide range of sizes and wall thicknesses. Our engineers will be glad to assist you in developing the product to meet your specific needs.

Write for Bulletin CP554.

THE ORIGINAL FABRICATORS OF
TEFLON PACKINGS AND GASKETS

*DuPont Trademark



9 Broadway, New York 4, N.Y.

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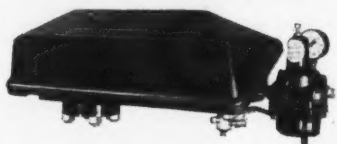
Here's Force-Balance* Accuracy and Ruggedness in a Complete Line of Pneumatic Transmitters . . .

FLOW, LEVEL, or DENSITY TRANSMITTER—Differential Type



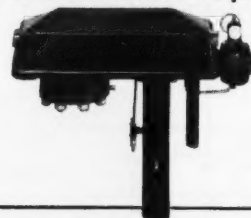
Available with differential ranges as low as 0-0.6" H₂O (ranges this low are exclusive with the Republic Transmitter) and as high as 0-750 psi. Range may be suppressed up to 80% of full scale for density or level measurements.

PRESSURE and ABSOLUTE PRESSURE TRANSMITTER



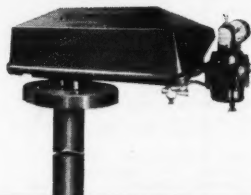
Pressure ranges from 0-1" H₂O to 0-2000 psi. May be easily adapted for absolute pressure ranges from 0-25 mm Hg to 0-100 psia.

FLOW TRANSMITTER—Square Root Extracting Type



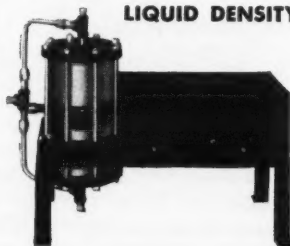
Automatically extracts square root function from flow measurements, permitting use of uniformly graduated charts and linear control devices. Available in all standard differential ranges.

LIQUID LEVEL TRANSMITTER—Bouyancy Type



Ranges to suit most applications. Can be used to measure level in closed tanks under pressure. Can also measure liquid-to-liquid interface.

LIQUID DENSITY TRANSMITTER—Bouyancy Type



Makes continuous density measurement of flowing liquids at line pressures to 300 psi. Fast response.

PNEUMATIC or PNEUMATIC-ELECTRIC TRANSMISSION

Special electrical meter body available for use with most Republic Pneumatic Transmitters. Permits locating pneumatic transmitter at metering point to cut piping costs and keep dangerous fluids out of control rooms.

for Measuring FLOW — PRESSURE — LEVEL — DENSITY

Republic Pneumatic Transmitters are as simple in operating principle as a laboratory weigh scale—and just as accurate! The only real difference is that forces instead of weights are balanced for a measurement.

This force-balance principle both permits and requires the use of strong, durable construction. That's why Republic Transmitters can be ruggedly built for low maintenance without sacrificing accuracy and sensitivity. Standard models are guaranteed accurate to 1/2% of full scale.

Range Flexibility—Changing ranges is merely a matter of shifting leverages in Republic Transmitters. Ranges may be changed as much as 2-1 on standard models, as much as 10-1 on double weighbeam models *with no change of parts*. Suppressed, reversed and compounded ranges are also readily available.

Corrosion Protection—Since process fluids are isolated to a small measuring chamber, special materials may be used for corrosion resistance. Minimum movement of fluid in chamber cuts maintenance when transmitter is used with dirty or viscous liquids.

These are but a few of the many features found in Republic force-balance Transmitters. Write for a free copy of DataBooklet with all of the details and complete description of various types.

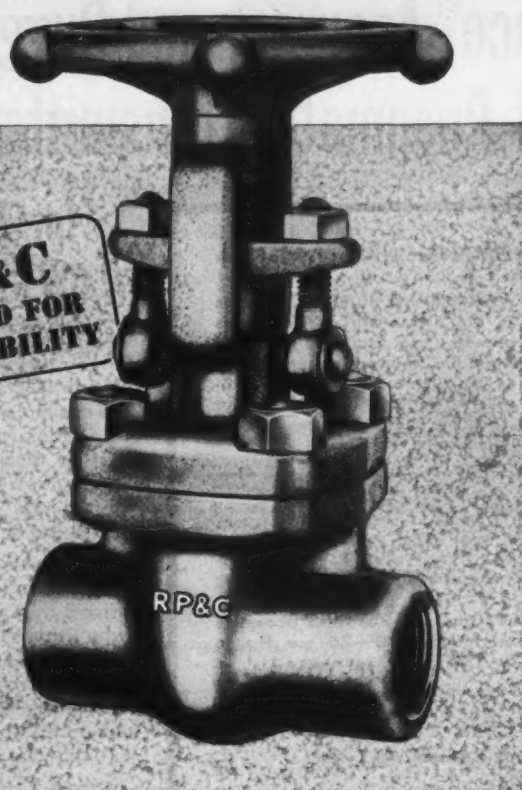
*In a force-balance pneumatic transmitter, a force produced by the process variable is balanced against a pneumatic pressure. The amount of air pressure required to produce a balance is proportional to the process variable and may be conducted to remote reading instruments or used as the measuring impulse for an automatic controller.

REPUBLIC FLOW METERS CO. • 2240 Diversey Pkwy., Chicago 47, Illinois

When inquiring check CP 4571 opposite last page



R-P&C
DESIGNED FOR
DEPENDABILITY



New R-P&C F56 and F57 Forged Steel Gate Valves

... FOR GREATER ADJUSTABILITY,
SMOOTHER OPERATION, LONGER PACKING LIFE

• These, and many other "plus" features, have been designed into these brand-new valves specially developed for power, petro-chemical, and process piping applications. Rated for 2000 PSI at 100° F or 800 PSI at 800° F, they are furnished in sizes from 1/4" to 2" with either screwed (F56) or welded (F57) ends.

Their advanced new design includes quality features like a new "tear-drop" 500 BHN heat treated stainless steel wedge which is mated with hard chrome plated stainless steel seat rings to effectively resist seizing, galling or abrasive wear. A Flexitallic spiral-wound gasket, reusable in normal service, assures a positive tight joint. Bulky flanges are eliminated for lower weight and streamlined appearance. Follower, eyebolt, gland nut and operating nut are all stainless steel.

The end result is a lighter, yet sturdier valve which gives better service. Get the complete story. Write today for Bulletin DH-525.

R-P&C Valve Division
AMERICAN CHAIN & CABLE

Reading, Pa., Atlanta, Boston, Chicago, Denver, Detroit,
Houston, New York, Philadelphia, Pittsburgh, San Francisco,
Bridgeport, Conn.

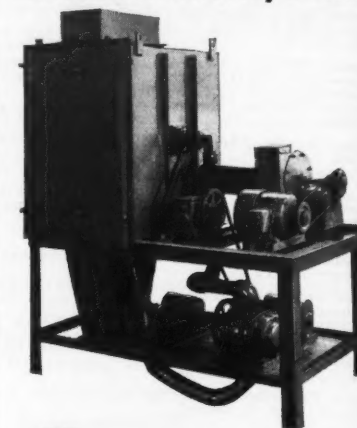
R-P&C
valves

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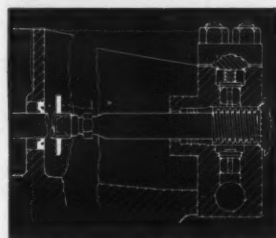
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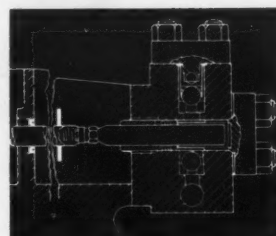
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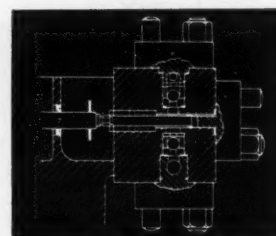
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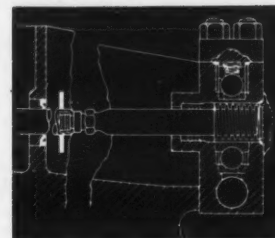
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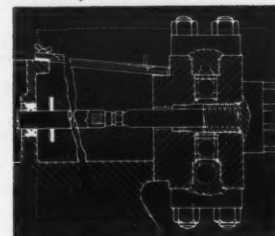
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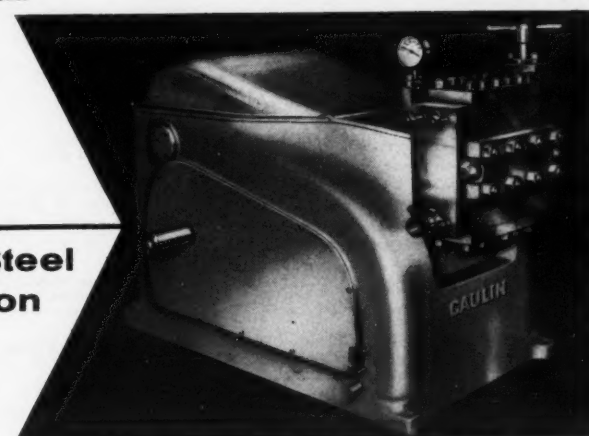
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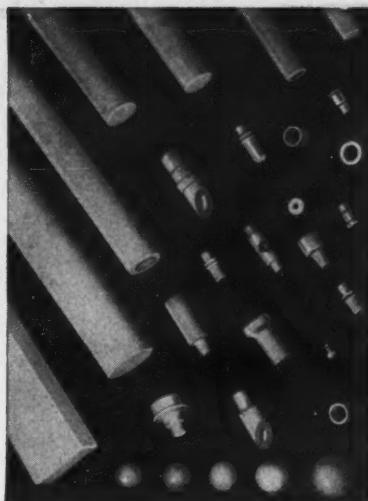
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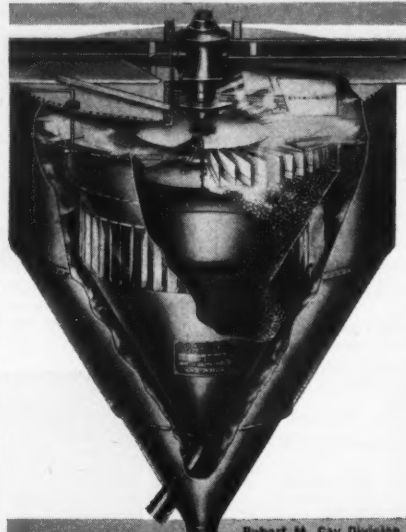
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4003c	Liquid Chlorine	4055	Cyclohexanone	4104	Radiation Pyrometer	4171	Controllers	4223	Glass Pipe
4003d	Caustic Soda	4056	Industrial Aromatics and Chemicals	4105	AC Electromagnetic Pump	4172	Digital Computer	4224	Corrosion-resistant Fittings
4003e	Paradichlorobenzene	4057	Trichlorethylene	4106	Tractor-shovel (state model)	4173	Gages and Thermometers	4225	Positive-displacement Pump
4003f	Tetrachloro Phthalic Anhydride	4058	Process Equipment Fabrication	4107	Stainless Tubing	4174a	Liquid Level Controls	4226	Polyethylene Tanks
4004	Thermal Liquid Heater	4059	Polyvinyl Acetate Emulsions	4108	Refractories	4174b	Ice Thickness Controls	4227	Flexible Metal Hose
4005	Thermal Liquid	4060	Glass-Dacron Yarn	4109	Butyrate Pipe	4174c	Non-conductive Liquids	4228a	Teflon Packing
4006	Motor Control	4061	Cd-Ba Stabilizers	4110a	Caprylic Acid	4174d	Standard Time Switches	4228b	Self-sealing Packing
4007	Plastic Drum, Bag, and Carton Liners	4062	Nitroparaffins (state which)	4110b	Fatty Acids	4174e	Cycle Repeating	4229	Insecticide Dust Diluents and Carriers
4008	Vibrating Screen Separator	4063	Polymerization Chemicals	4110c	Methyl Esters	4174f	Program Clocks	4230	Chemistry of Carbon Compounds
4009a	Adjustable Stroke Pumps	4064	Lithium Borohydride	4111	Horizontal Spray Dryer	4174g	Time Delay Relays	4231	Engineering Materials
4010	Centrifuge	4065	Liquefied Petroleum Gas	4112	Duct Fans	4174h	Automatic Reset Timers	4232a	Intensifier
4011	Dryer	4066	Sodium Phosphates	4113	Computing Facilities	4174i	Electronic Timers	4232b	High-pressure Pump
4012	White Resin Paints	4067a	"Glycerine Alkyls Tailored to Need"	4114	Gas-engine Compressor	4175	Decode Boxes	4232c	Accumulator
4013	Rotary Vacuum Dryer	4067b	"Federal Specification for Glycerine"	4115	Corrosion-resistant Castings	4176	Valves (state which)	4232d	Hydraulic Jack
4014	Wrought Iron Fittings	4067c	Glycerine Properties and Applications	4116	Acid-resistant Uniforms	4177	Plastic Pipe, Fittings, Valves & Sheets	4233	Adjustable-diameter Shafts
4015a	Tube-in-strip Fabrication	4068	Polyvinyl Acetate Emulsion Paints	4117	Carbon Reactions	4178	Protective Coatings	4234	Marine Loading Arm
4015b	Heat Exchanger Tube	4069	Anti-static Finish	4118	Blueprint Rack	4179	PVC Fittings and Flanges	4235	Chains and Sprockets
4016	Lead Wire Insulation	4070	Dyeing and Printing Pastes	4119	Finned Condenser Tube	4180	Porcelain Valves	4236	Conveyor System
4017	Mechanical Rectifiers	4071	Hard Waxes	4120	Welding Fittings	4180a	Glass-coated Smokestacks	4237	Rotary Airlock Feeders
4018a	Mechanical and Hydraulic Governor	4072	Epoxy Resins	4121	Company History	4181	Teflon Hose	4238	Telescoping Conveyor
4018b	Diaphragm Valves	4073a	Benzene	4122	Aluminum Foil	4182	PVC Sheets and Flanges	4239	Pipe Sling
4018d	Bellows Valves	4073b	Toluene and Xylene	4123	Water Analysis	4183	Cad Steel Equipment	4240	Fork Lift Truck
4018e	Pinch Valves	4073c	Propylene Polymer	4124	Lithium Compounds (state which and use)	4184	Centrifugal Self-priming Pump	4241	Corrugated Boxes and Cartons
4019	Methyl Vinyl Ketone	4073d	Sunaptic Acid	4125	Aperture Cards	4185	Rainbow Coatings on Equipment	4242	Cleats
4020	Cementing Teflon	4073e	Petroleum Drying Oil	4126	Spiral-wound Gaskets	4186	Corrosion-resistant Alloy	4243	Safety Step Ladders
4021	Alkane	4073f	Water-soluble Sulfonate	4127a	Furfural	4187	Stainless Steel Fastenings	4244	Belt Conveyor
4022	Fluorocarbon Lubricants	4073g	Sulfur	4127b	Furan Chemicals	4188	Plastic-lined Pipe, Valves & Fittings	4245	Torque Converters
4023a	"The Chemistry of Fatty Acids"	4073h	Anhydrous Ammonia	4128	Pneumatic Regulator	4189	Corrosion-proof Flooring	4246	Dry Material Conveying Systems
4023b	Fatty Acids	4074	Silica Gel	4129	Lead Cells	4190	PVC Pipe	4247	Gas Fork Lift Truck
4024	Trimethylolmethane	4075	Coumarone Indene Resins	4130	Liquid Meter	4191	Castable Ceramics	4248	Hand Truck
4025	Surface Active Agents	4076	Buffing Compounds for Aluminum	4131	Unplasticized PVC Fittings	4192	Heat Exchangers	4249a	Pulleys
4026	Hydrated Alumina	4077	Open-gear Lubricant	4132	Pressure Gages	4193	Stainless Tubing and Pipe	4249b	Hoists
4027	Boron Carbide	4078	Glycerine Alkyls	4133	Time Recorder-Totalizer	4194	Direct-from-drum Pump	4249c	Trolleys
4028	Malonaldehyde Diacetal	4079	Resins	4134	Gage Illuminator	4195	Blast Cleaning	4249d	Hoist Chain
4029	Activated Charcoal	4080	Methyl Chloride	4135	Humidity Controller	4196	Glass-lined Dryer-Blender	4249e	Cranes
4030	Silicone Additive	4081	Organosilicone Compounds	4136a	pH System Analysis Form	4197a	Glassed-steel Trailer Tank	4249f	Load Binders
4031	Rubber Pigments	4082	Specialty Chemicals	4136b	Industrial pH Measurement and Control	4197b	Glassed-steel Reactor	4250	Turbine-type Pump
4032a	Pentaerythritol	4083	Pyromellitic Acid and Dianhydride	4137	Potentiometer	4198	Coating for Insulation	4251	Booster Conveyor
4032b	Polyhydric Alcohols (state which)	4084	Methyl Acetoacetate	4138	Integrator	4199	Acid Pumps	4252	Air Valves
4033	"Solvent Recovery Actually Takes Dollars Out of the Air"	4085	Stain, Blister-resistant Paints	4139	Diaphragm Valve	4200	Zinc Coating	4253	Gas Transportation and Storage (state requirements)
4034	High-purity Chemicals (state use)	4086	"Sodium Nitrite for Rust Prevention and Corrosion"	4140	Consulting Engineers	4201	Aluminum Heat Exchangers	4254	Tank Weighing System
4035	Emulsifiable Wax	4087a	Fumaric Acid	4141	Infrared Analyzers	4202	Red Primer	4255	Hand Truck
4036	3-Methoxypropylamine	4087b	Phthalic Anhydride	4142	Voltmeter	4203	Plastic Pipe	4256a	Tubular Conveyor
4037	Polymerizable Dispersant	4087c	Maleic Anhydride	4143	Pressure Switches	4204	Porcelain Pipe and Process Equipment	4256b	Bucket Elevator
4038	Biochemicals	4088	Solvent Recovery System	4144	Pneumatic Controllers	4205	Stainless Steel Faucet	4257	Industrial Gloves
		4089	Microglass Film	4145	Automatic Tank Gage Pumps	4206	PVC Equipment	4258	Roller Chain Drive
		4090	Systemic Insecticide	4146	Corrosion-resistant Instrument Tubing	4207	Stainless Valves	4259	Porcelain Jars, Pots, Cocks, Tanks
				4147	Alarm Tester	4208	Polyethylene Tanks		
				4148	pH Meters				
				4149	Pneumatic Controller				
				4150	Gages				

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(Continued from reverse side of this sheet).

MARCH 1954

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4260	Fork Truck	4324e	Blender	4389	Fire Control	4453	Welded Pipe and Tubing	4520c	Cyclones
4261	Conveyor Roller	4324f	Granulator	4390	Drum Dryer	4454	Silent Check Valve	4521	Industrial Ventilating Fans
4262	Scraper Storage Machine	4324g	Pulverizer	4391	Diaphragm Pump	4455	Centrifugal Pump	4522	Micro Photography
4263	Belt Conveyor	4324h	Mixer	4392	Cylinder Valves	4456a	Filter Media	4523	General Purpose Valves
4264	Portable Drum Rotator	4324i	Conveyor	4393	Mercury Vapor Monitor	4456b	Wire Cloth	4524	Flexible Metal Hose
4265	Stainless and Monel Utensils	4325	Hand Centrifuge	4394	Safety Equipment	4457	Dust Collector	4525	Drip-proof Motors
4266	Drum Truck	4326	Dew Point Indicator	4395a	Safety Can	4458	Epoxy Adhesive	4526	Welding Electrodes
4267	Metal Grating	4327	Borosopes	4395b	Disposal Can	4459	Insulations, Packings, Roofings	4527	Air Regulator
4268	Skip Elevator	4328	Isopropyl Borate	4395c	Safety Transfer Pump			4528	Magnetic Drives
4269	Vibratory Feeder	4329	Viscometers	4395d	Safety Storage Cabinet	4460	Motors	4529	Metering Pumps
4270	Glass-lined Storage Units	4330	Explosion-proof Pump	4395e	Laboratory Safety Equip-	4461	Gasket Cutter	4530	Aluminum Windows
4271	Air Conveyor	4331	Screen Separator	4395f	menal	4462	Drum Dryer	4531	Steel Tube
4272	Bulk Trailer	4332a	Coolers	4395f	Fire Protective Devices	4463	Quick-opening Valve	4532	Air-driven Tube Expander
4273	Trucks	4332b	Dryers	4396	Aerosol Extinguisher	4464	Micro-bellows Pump	4533	Channel Pipe
4274	Flooring	4332c	Roasters	4397	Solenoid Starter	4465	Industrial Gloves	4534	Process Heating Equipment
4275	Liquid, Gas, Slurry Pump	4333	Dryer	4398	Standard and Bellows-type	4466	Stainless Steel Fittings	4535	Magnetic Drums
4276	Magnetic Screen	4334	Disintegrators	4399	Relief Valve	4467a	Batch-mixing Calculator	4536	Sprayed Coil Dehumidifiers
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4278	Proportioning System Control	4336	Equipment	4400	Fireman Suit	4468	Explosion-proof Fixtures	4539	Visual Control Board
4279	Pneumatic and Electric	4337	Sintered Metal Filter	4401	Fire-resistant Lubricants	4469	"The Best in Teflon"	4539	Plastic Pump
	Vibrator	4337	Processing Equipment	4402	Floor Paint			4540	Steel Plate Fabrications
4280	Drum Handling Attachment	4338	Mixer	4403	Respirator	4470	Pipe Fittings	4541	Gaskets, Shims, and Washers
4281	Concrete Storage Bin	4339	Horizontal Plate Filter	4404	Natural-frequency Conveyor	4471	Gearmotor	4542	Engineering Consultants
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4284	Oscillating Conveyor	4341b	Electric Heat Exchanger	4407a	Protective Linings and	4472c	Processing Equipment	4545a	Hard-facing Alloys
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4286	Skatewheel Conveyor	4343	Scrubbers	4407b	Field Service	4474	Filter Press Closer	4546	Purifier
4287	Trucks	4344	Solenoid Pilots	4408a	Filter Cloth	4475	Hose Swivel Check Valve	4547	Rotary Pump
4288	Automatic Scale	4345	Batch Centrifugals	4408b	Filter Paper	4476	Centrifugal Pumps	4548	Urea and Melamine Coating
4289	Tractor Shovels	4346	Dispersing Mixers	4409	Tantalum	4477	Filter Fabric	4549	Nickel-plated Steel
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4291a	Industrial Chemicals	4348	Heat Exchangers	4411	Optical Comparator	4479	Vertical Wet Pit Pump	4551	Motor Armor
4291b	Laboratory Equipment	4349	Solvent Extraction Column	4412	Valves	4480	Dust Filters	4552	Rotary Joint
4292	Ceramic Bodies and Shapes	4350a	Sheet Filters	4413	Heat-resistant Coating	4481	Dust Filters	4553	Rod, Ball, and Pebble Mills
4293	Filters, Mixers, Tanks	4350b	Asbestos Filter Sheets	4414	Dust Collectors	4482	Valve Selection Chart	4554	Pyrometers
4294	Sodium Dissolvers	4351	Still	4415	Positive Displacement Blowers	4483a	Drip-proof Motors	4555	Biochemicals
4295	Sodium Dispersions	4352	Waste Treatment Equipment	4416	Mechanical Rectifier	4483b	Totally-enclosed Motors	4556	Turbo-dryers
4296	Manometer	4353	Pulverizers	4417	Flexible Hose	4484	Paper Coating Mixer	4557	Impervious Graphite Heat
4297a	Antifoam A	4354	Continuous Centrifuge	4418a	Aluminum Floor Grating	4485	Lined Steel Containers	4558a	Exchangers (state type)
4297b	Antifoam AF Emulsion	4355	Heat Exchanger Door	4418b	Contour Retainer Mesh	4486	Surface-active Chemicals	4558b	Disc Separators
4298	Butyro Refractometer	4356	Centrifugals	4419	Ceramics	4487	Ventilating Controller	4559	Cylinder Separators
4299	Lab Stirrers	4357	Chlorinators	4420	Filter Material	4488	Protective Coatings	4559	Grader
4300	Vertical Filters	4358	Roller Mill	4421	Plate Fabrications	4489	Desiccant Dryers	4560	Leak-proof Canned Pump
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4302	Rubber Stoppers	4360	Continuous Dust Collector	4423	Process Pump	4491	Muller-type Mixer	4562a	Fluid Meter System
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4304b	Water Demineralizer	4364	Tablet Coating Machine	4426	Automatic Lubricator	4494	Hydraulic Tube Fittings	4562b	Breaker
4305	Rotameters	4365	Rotary Batch Mixer	4427	Immersion Steam Boilers	4495	Liquid-solid Separator	4562c	Crusher
4306	Fluorocarbon Rubber	4366	Filter Presses	4428	Nickel-Copper Alloy	4496	Aluminum Bronzes	4562d	Hammer Mill
4307	Thermo Balance	4367	High-vacuum Stills	4429	Screw Pump	4497	Roofing Materials	4562e	Granulator
4308	Plastic Labware	4368	Screw-conveyor Heat	4430	Impregnated Gasketing	4498	Tank Insulation	4562f	Fiberizer
4309	Viscometer Stands	4368	Exchanger	4431	Lubricants	4499	Industrial Filter	4563	Chemical Pump
4310	Liquid Pumps	4369	Polyethylene Film Liners	4432	"Saving Old Roofs"	4500	Radiochemicals	4564	Pump Stuffing Boxes
4311	Ion-exchange Kit	4370	Acid Shipper	4433	Flexible Strut Joints	4501	Cement Tester	4565	Mechanical Shaft Seal
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4313	Liquid Indicator	4372	Caution Label	4435	Redwood Tanks	4503	Centrifugal Pump	4568	Dryers and Coolers
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4315	Lab Clamp	4374	Pallet	4437	Equipment Fabrication	4505	Conversion Table	4570	Pumps
4316	Lab Still	4375	Wire Conveyor Belts	4438	Tube Cutter	4506	Dust Filters	4570a	Teflon Bearings, Bushings,
4317	Diatomite Filter Aids	4376	Marker	4439	Centrifugal Compressor	4507	Core Ovens	4570b	and Washers
4318	Filter Paper	4377	Steel Strap	4440	Buffing and Finishing	4508	Cast Iron	4571	Teflon Rod, Tube, and
4319	Pulverizers (state require-	4378	Steel Containers	4441	Compound	4509	Stainless Valves	4572a	Cylindrical Shapes
	ments)	4379	Scales	4442	Piston Packing	4510	Rubber Lining	4572b	Pneumatic Transmitters
4320	Electronic Computers	4380a	Cams	4443	Ventilator	4511	Relief Valves	4572c	Gate Valve
4321	Fluid Agitator	4380b	Lithographing Service	4444	Air Valve	4512	Filter Aids	4572d	"How To Protect Your
4322	Kjeldahl Digestors	4381	Fibre Drums	4445	Steel Tubing	4513	Alloy Tube	4573	Valves"
4323	Tubing Clamps	4382	Filling Hoods	4446	Filters and Evaporators	4514	Lubrication Transfer Pump	4574	Dust Collector
4324a	Grinding Machine	4383	Printing Machine	4447	Horizontal Plate Filter	4515	Direct Flow Pumps	4575	Corrosion-proof Pump
4324b	Crusher	4384	Portable Bag Closer	4448	Wire Mesh	4516	Gas Analyzer	4576	Teflon Products
4324c	Separator	4385	Can Sealer	4449	Submersible Pump	4517	Equipment	4577	Centrifugal Air Separator
4324d	Selector	4386	Steel Strap	4450	Control Valve	4518	Radiant Heat	4578	Concrete Floor Patch
		4387	Multi-wall Bags	4451	Plant Engineers	4519	Mechanical Seals	4579	Modified Starches
		4388	Fire Protection	4452	Pre-mixed Grout	4520a	Electric Precipitator		
					Custom Plastics Service	4520b	Fly Ash Collector		

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**THAT'S
INTERESTING**

(Continued from page 2)



"You say you like your martinis EXTRA dry?"

Aerosols galore

A silicone-base lubricant and rust-proofing product for laboratory and surgical instruments is supplied in an aerosol push-button can. After cleaning, instruments are sprayed sparingly, then wrapped and placed in a sterilizer or autoclave. Product will withstand three to four autoclavings before having to be renewed.

Family medicine cabinet may soon be filled with drugs in spray form, if recent advances prove out. Almost any drug product which is meant to be applied externally can be adapted for aerosol packaging, according to Morris J. Root, technical director of G. Barr and Co.

Tin disease

Phenomenon of white tin changing to gray tin at temperatures below 56°F is sometimes referred to as "tin disease" because of the wart-like appearance of the gray tin and the way in which it spreads over the surface of white tin. A sample of tin which is "infected" may cause other samples to become infected also.

Gray tin is nonmetallic, brittle and useless for most purposes. However, its electrical properties resemble those of germanium and silicon to a considerable extent.

That others might see

Silicone rubber is providing added protection and increasing possibilities of success in corneal transplants by enabling shipping containers for donors' eyes to be successfully sterilized. Former gaskets for the bottles would not stand the pressure and temperature of sterilization.

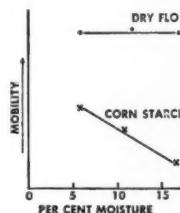
*from a kernel of corn
through chemistry...*

STARCH

that flows
like water

It's National's free-flowing, modified starch—DRY FLO.[®] Essentially an organic powder, you can pump it! Spray it! Just like a liquid.

Further, DRY FLO is water repellent. Actually floats on water. Yet it can absorb moisture with hardly any loss of either water repellency or mobility, as illustrated on the chart.



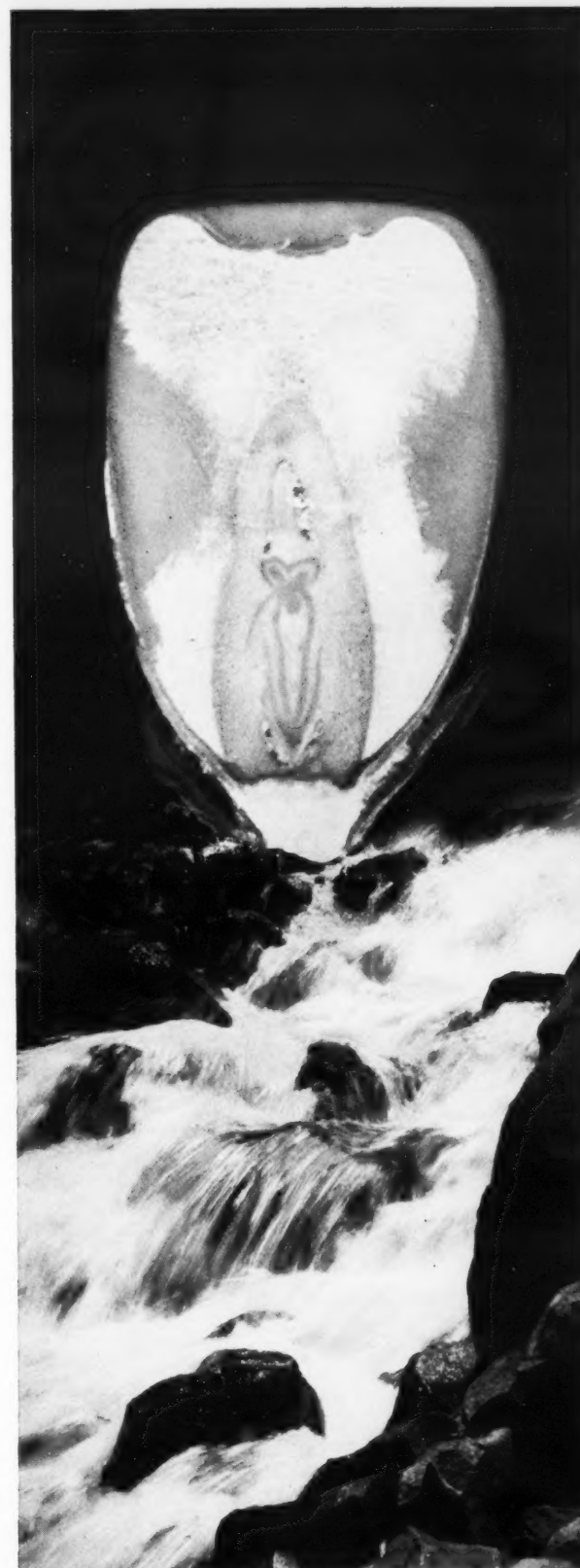
DRY FLO's properties are unmatched by any known powder. They suggest these uses:

- Dusting agent. For plastic films, rubber, etc.
- Spray to prevent offset in printing.
- Moisture absorbent. As a processing aid.
- Anticaking or free-flowing agent.
- In pharmaceutical products.
- In cosmetics.

Where can you use DRY FLO?

National
STARCH PRODUCTS INC.

National Starch Products Inc.
270 Madison Ave., New York 16, N. Y.



Kernel of corn photo courtesy of Corn Industries Research Foundation, Inc.

When inquiring check CP 4578 opposite last page

12th annual
conference
and 1956
corrosion show

**NATIONAL
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of
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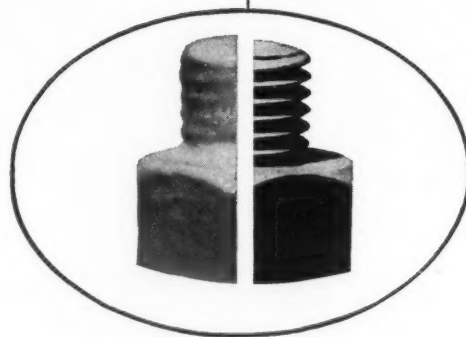
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**CUT YOUR MAINTENANCE PAINTING
COSTS UP TO 50% *with*
AMERCOAT 87 VINYL MASTIC**



HERE IS HOW THIS REMARKABLE PROTECTIVE COATING CAN SAVE YOU MONEY:

1. Only one cross spray coat over a primed surface is required for complete protection—this means lower labor costs.
2. Fewer scaffolding and rigging shifts are required.
3. Less down time—dries to touch in minutes, eliminates the risk of contamination between coats.
4. Greater thickness means longer life—lower cost per square foot per year.



Amercoat 87's thixotropic characteristic helps provide extra thickness on sharp edges and irregular surfaces; it is non-porous and will not crack or check.

Amercoat 87 combines the time-tested chemical and weather resistance of vinyl coatings with the thickness of conventional mastics, yet is easily applied with standard industrial spray equipment.

We will be pleased to send you our technical bulletin describing this coating in detail.

**Amercoat
CORPORATION**

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